MEMORANDUM

TO: Julie Doumbia, BPA

FROM: Michele DeHart

DATE: July 12, 2019

RE: Review of Draft CRSO Chapter 3 – Environmental Consequences, 3.4.3.1 - 3.4.3.2 Modeling – 3.4.5.1.1.1.1.1 - 3.4.5.1.1.1.1.1.1 Upper Columbia Spring Chinook Evolutionary Significant Unit (ESU)

In response to your request, the Fish Passage Center (FPC) staff and the Comparative Survival Study (CSS) Oversight Committee reviewed the draft section of Chapter 3, which you provided by email on July 2, 2019. This is a partial and rough draft of Chapter 3 (Draft), which only includes results for Upper Columbia Spring Chinook. We have developed these comments according to your instructions (attached), and only comment and review the components that the FPC/CSS have developed. We do have comments on the other components of this draft but will reserve them for submittal at a later time as per your instructions. As noted in responses to questions from the federal agencies on June 14, 2019, the FPC/CSS will not provide model results for Upper Columbia River stocks of salmon and steelhead. However, the CSS Annual Report for 2018 includes preliminary modelling results for Upper Columbia spring chinook which should be reflected in the EIS, and will illuminate the consideration of federal alternatives being considered in the CRSO EIS and the anticipated impact of those alternatives on Upper Columbia populations of spring chinook. In addition, analyses that have been presented to the region illuminate the effects of hydrosystem operations on Upper Columbia steelhead to the degree that the federal CRSO alternatives affect spill and flow.
CSS Life cycle model analyses addressing the Upper Columbia

The 2018 CSS Annual Report, Chapter 2, includes the development of a life-cycle model for Wenatchee River and Methow River spring chinook. This CSS life-cycle analyses is a retrospective analyses of Upper Columbia spring chinook and is in the early stages of development. The development of the Upper Columbia Spring Chinook life cycle model provides a foundation upon which to pursue investigation into stage-specific questions relating to the life cycle survival and abundance trends of salmon populations. The results presented in the 2018 CSS Annual Report illustrate how survival and long-term return abundance may respond to changes in hydrosystem operations and environmental conditions. Empirical estimates of demographic rates are consistent with the findings for the Snake River populations that SARs have improved since hydrosystem operations have been modified to reduced powerhouse passage. This preliminary analyses detected a negative effect of both Upper and Lower Columbia powerhouse passage, but note that the Upper Columbia passage index was based purely on spill volumes, and does not account for structural changes to the projects that may affect the efficiency of spill. We also detected a negative effect of PDO and a positive effect of upwelling effect on ocean survival. The results are preliminary in the sense that we have yet to integrate populations into a single assessment, nor has the analysis accounted for prior information relevant to tributary dynamics and ocean dynamics. That said, the model effectively accounts for prediction and measurement uncertainties, which represents a significant step forward in reconciling life stage predictions with data deficiencies. The CSS has a stated objective of providing meaningful insights and comparative analyses to aid in the assessment of population trends and recovery potential for Columbia basin salmon populations.

Overall SARs for Upper Columbia populations calculated in the CSS study are available to the public on the FPC website. PIT-tag SARs for Upper Columbia hatchery spring Chinook (Leavenworth) are consistently highly correlated with wild and hatchery spring/summer and spring Chinook stocks from both the Snake River and Mid-Columbia regions. This has been a consistent finding and indicates that Upper Columbia populations and Snake River populations of spring chinook have similar responses to shared experiences, in the lower Columbia River and the estuary ocean. These findings indicate that Upper Columbia spring Chinook can be expected to respond to spill and flow levels and ocean conditions in a similar manner to their Snake River counterparts.

Regional Analyses that include Upper Columbia Steelhead

A model and set of prospective simulation analyses was presented at the 2018 Pacific Coast Steelhead Management Meeting titled, Factors Associated with the Regional Patterns of Steelhead Survival in the Columbia River Basin (Haeseker et al. 2018). This analysis considered wild steelhead populations from the Snake, Entiat-Methow (Upper Columbia), John Day and Yakima rivers. Although these populations have different locations of origin they share a migration corridor through the middle Columbia River, along with shared estuary and ocean conditions. The model included the powerhouse passage index (PITPH), water transit time, and ocean conditions. The model analyses compared two operational scenarios, (1.) the Biological Opinion, which would correspond to the No Action Alternative in the CRSO EIS, and (2.) spill to the 125% tailrace gas cap, which would correspond to the MO4 Alternative in the CRSO EIS. This analysis should be considered in the CRSO EIS because it indicates, consistent with
previous CSS analyses, that Upper Columbia steelhead populations have similar responses to fresh water migration conditions (powerhouse passage experiences and flow) and marine conditions as their Snake River counterparts. The analysis indicated that SARs of wild steelhead from the Entiat and Methow rivers would increase by 28% under a 125% TDG spill operation at the lower Columbia River dams (McNary, John Day, The Dalles, and Bonneville) compared to the Biological Opinion spill levels. These improvements in SARs from this analysis are an indication of the improvements that would be expected under the MO4 Alternative compared to the NAA Alternative and should be considered in the CRSO EIS.

Reference