

Project ID: 35030

Project title: Evaluate potential to enhance spawning of summer/fall chinook salmon in the tailrace of Chief Joseph Dam, Columbia River

Project sponsors: PNNL and CCT

ISRP Comment – Describe limitations to changing operations at Chief Joseph Dam. For example, how does the Vernita Bar Agreement affect chinook in the Chief Joseph tailrace. Review the work by Chapman et al. 1983 in order to provide a context for the work proposed here.

Response: One of the goals of this project is to evaluate the potential to enhance summer/fall chinook salmon production in the tailrace of Chief Joseph Dam. We propose to “make recommendations to the fishery managers on the quality of summer/fall chinook salmon spawning habitat in the tailrace of Chief Joseph Dam, and the feasibility of increasing production under revised operations during the spawning period (e.g., 4-6 weeks in the fall).”

As the ISRP correctly points out, there may be a number of existing limitations to implementing our recommendations. For example, the Vernita Bar Agreement outlines very specific actions that the PUDs and BPA (the Corps is not a party to the Agreement) must follow to minimize formation of fall chinook salmon redds above the 70 kcfs elevation on Vernita Bar in the Hanford Reach. This is accomplished through Mid Columbia Hourly Coordination and Reverse Load Factoring. The Mid Columbia Hourly Coordination is the operation of Grand Coulee, Chief Joseph, Wells, Rocky Reach, Rock Island, Wanapum, and Priest Rapids pursuant to the “Agreement for the Hourly Coordination of Projects on the Mid-Columbia River”. Reverse Load Factoring is the intentional reduction of power generation during the day and the corresponding increase in power generation during hours of darkness for the purpose of influencing the location of redds on Vernita Bar. Consequently, even though the Corps is not a direct party to the Agreement, through Hourly Coordination they work in cooperation with BPA and others to meet flow targets at Chief Joseph Dam.

We recognize the complexities of the Vernita Bar Agreement (especially as they relate to operations at other mid-Columbia dams including Chief Joseph) and suggest our final report will examine these limitations in detail. We believe that although existing agreements are in place that generally guide operations at Chief Joseph Dam, there may be other more subtle changes that could have significant effects on availability and/or quality of spawning habitat. For example, alterations in inflow in combination with alterations in the reservoir behind Wells Dam (operated by Douglas County PUD, it is the next dam 29 miles downstream from Chief Joe) may alter spawning habitat availability by changing the amount of riverine habitat in the tailrace area. In addition, there may be other changes in habitat quality or quantity that enhance spawning potential but have nothing to do with hydrosystem operations (e.g., gravel placement). Either way, without empirical data on the habitat quality and quantity in combination with the modeling effort

to explore how changes in hydraulic characteristics will occur, there is no way to objectively explore the gain or loss in potential habitat. Should this study be funded, we will be able to do this, and our final report will evaluate whether it is practical or feasible to accomplish increased production given existing limitations.

Regarding the work conducted by Chapman et al. 1978-1982, this 5-year study was designed to address the effect of frequent flow fluctuations on spawning and incubation of fall chinook salmon at Vernita Bar. Specifically, the studies were concentrated on 1) redd abundances at different flow levels, 2) physical and chemical characteristics of the redd environment, 3) egg incubation and survival, and 4) options for enhancement of spawning success. The co-PI from PNNL is very familiar with the work by Chapman et al. as it directly relates to projects he has conducted in the Hanford Reach. This information will be used to guide the study proposed here.