

*Implications of Pre-Restoration Monitoring for the Proposed Rechannelization of the Sandy River Delta in Tidal Freshwater of the Columbia River*

Johnson, Gary (PNNL), Nichole Sather (PNNL), Amanda Bryson (PNNL), Christine Mallette (ODFW), and John Skalski (UW)

Site-specific understanding of the Sandy River delta gained from pre-restoration monitoring is applicable to a discussion of the efficacy of the proposed reconnection of the old Sandy River to the Columbia River. The primary outlet of the Sandy River was plugged with an earthen dam in the 1930s. The low degree of connectivity between the Sandy River and the historic confluence likely constrains the functional integrity of this floodplain-deltaic ecosystem. Removal of the dam will be aimed at reestablishing the connectivity of the Sandy River channel to its historic confluence. In pre-restoration sampling of fish and habitat characteristics within a formal before-after-control-impact design, we noted the low degree of surface water connectivity was correlated with low dissolved oxygen within the remnant channel, yet the absence of elevated water temperatures indicated the remnant channel maintains some degree of hyporheic connection with the Sandy River. Vegetation surveys near the remnant channel indicate a large proportion of obligate wetland species. Compared with other sites closer to the Columbia River, the remnant channel was also noted to have the greatest amount of submerged aquatic vegetation. We sampled juvenile Chinook and coho salmon in the remnant channel during our study. Removal of the earthen barrier likely would increase fish accessibility to this channel, as well as other habitats within the historic Sandy River delta. Changes in the flow regime, coupled with riparian plantings as part of other restoration efforts in the delta, will likely increase water quality, sediment export, and nutrient flux within the Sandy River delta. Confluences offer a source of heterogeneity in mainstem rivers by influencing morphological features and aquatic habitats. Reconnecting the old Sandy River channel to the Columbia River will likely increase the opportunity and capacity of habitats for aquatic biota, including juvenile salmon.