MIGRATION TIMING AND SIZE OF JUVENILE SALMONIDS ABOVE AND BELOW WILLAMETTE VALLEY PROJECT DAMS

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All data used in this presentation are preliminary. The primary objectives of our project were to evaluate the migration timing for juvenile salmonids and the size at which they entered and exited Detroit, Foster, Lookout Point, and Cougar reservoirs. Similar to previous years, data collected from our screw trapping efforts showed that a vast majority (>82% of annual catch) of juvenile Chinook salmon (*Oncorhynchus tshawytscha*) enter the reservoirs in spring as fry (<60 mm fork length), at a mean size of 35 mm FL. In instances where screw trap efficiencies were sufficient, we estimated the number of juvenile salmonids entering reservoirs. Specifically, in the South Fork McKenzie River upstream of Cougar Reservoir we captured 11,402 subyearling spring Chinook salmon and 6 yearlings in 2014. The estimated number of subyearlings that passed the trap in 2014 was 413,515 (95% CI ±56,164).

Screw trap collections allow us to track changes in emergence, growth, and migration timing among sub-basins on an annual basis. In summarizing these data we found similarities and differences between and among sub-basins. Emergence timing for salmonids in the Middle Fork Willamette and South Santiam rivers were similar, but earlier than emergence timing in the North Santiam River and South Fork McKenzie River. However, there was a great deal of variation in brood year strength of spring Chinook salmon in the South Fork McKenzie River, and in age and migration timing into the reservoir for winter steelhead (*Oncorhynchus mykiss*) in the South Santiam River (Figure 1).

Continued collection of screw trapping information enables us to make meaningful comparisons among years and could provide critical information about salmonid survival through projects. For example, we used the above and below dam migrant estimates from 2013 (2012 brood year) to estimate that ~17% (11.4 – 24.8%) of the Chinook salmon that entered Cougar Reservoir survived to below Cougar Dam. Long-term datasets from the South Fork McKenzie River may help determine how many transported adult Chinook are needed to reach carrying capacity for the available spawning habitat. To explore this relationship, we plotted the migrant estimates against the number of transported female Chinook that produced those migrants. A logarithmic regression line fitted to the plot suggested that carrying capacity has not been reached (Figure 2). However, there is currently only one year where >500 females were transported upstream of the dam; more data are needed to parameterize the fit of the curve for this region of the graph.

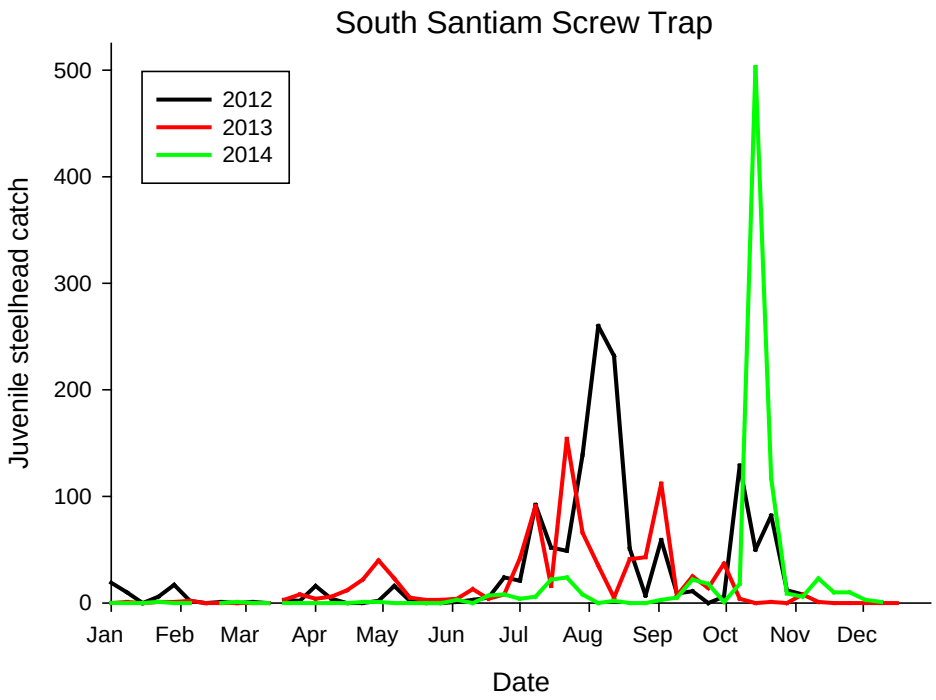

Figure 1. Migration timing of juvenile steelhead from the South Santiam River above Foster Reservoir (2012-2014). Total weekly catch was not expanded for trap efficiencies and includes multiple age-classes.

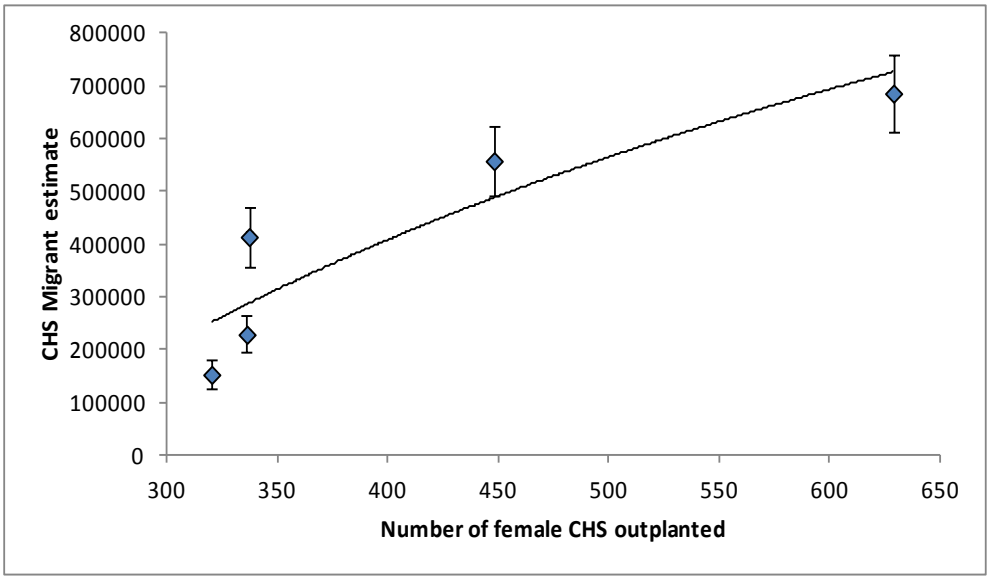

Figure 2. Yearly Chinook subyearling migrant estimates for the South Fork McKenzie River plotted against the number of females transported upstream of the dam for the corresponding brood year (2009-2013). The regression line is included for graphical representation only and does not allude to the actual maximum number of females appropriate for the available spawning habitat at any specific point.