

Abstract: Repeat spawning from steelhead kelts provides genetic and population stabilizing benefits, and as such management actions that promote iteroparity may aid recovery efforts. Between 2001 and 2004, 13,193 adult steelhead were collected in juvenile bypass systems at John Day, McNary, and Lower Granite dams and ultrasound exams indicated 89% (11,769) were post-spawn kelts. We PIT and/or radio tagged the majority of the sampled kelts to examine downstream migration behaviors and to estimate percentages returning on repeat spawning migrations. Studies continue through hydro-acoustic evaluation of seasonal project operations (i.e., from 1 March to 10 April) to evaluate surface flow outlet operations at the Bonneville Dam PH II Corner Collector (B2CC) as a means to bolster steelhead repeat spawning rates.

Results for the aggregate Columbia and Snake River kelt runs suggest that iteroparity rates vary along several gradients. First, there was a clear negative relationship between kelt outmigration distance and repeat spawner return rates, with much lower return rates for kelts tagged at Lower Granite Dam. Second, there was clear evidence for condition-dependent mortality, as kelts in good external condition returned at rates more than an order of magnitude higher than poor-condition fish from all collection sites. Third, females were both far more abundant than males and were at least two to four times more likely to return as repeat spawners. Fourth, proportionately more wild than hatchery fish and more small than large fish returned, particularly from upstream release groups. Repeat spawner return rates for the aggregated in-river samples were 5.45% (John Day), 5.37% (McNary), and 0.69% (Lower Granite). Returns for good condition kelts were 9.22%, 7.16%, and 1.19%, respectively.

Of relevance to adaptive hydro-actions were results indicating that out migration timing influenced returns, with higher returns from earlier outmigrants. Results have led to studies of the seasonal operations of the B2CC prior to passage operations for ESA-listed juvenile salmonids. Such operations could be particularly beneficial to both ocean and stream maturing steelhead spawning in tributaries to the Bonneville Pool. A discussion of synopsisized information as well as data collected spring 2007 from the B2CC will be presented at the symposium.

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