Use of known-source adult salmon and steelhead to evaluate homing and survival of adult migrants in the Columbia River: 2000-2002

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From 2000 to 2002 we radio-tagged 1,276 spring–summer chinook salmon and 1,285 steelhead at Bonneville Dam that had been PIT-tagged as juveniles in tributaries, at hatcheries or at Snake or Columbia River dams. About 57% of PIT-tagged fish were from the Snake basin, 29% were from sites upstream from Priest Rapids Dam, 9% were from the Yakima River and 3% were from the Wind River. Overall survival to natal basins was 81% for chinook salmon and 84% for steelhead. Yakima River chinook survived at relatively high rates (88.5%) compared to Wind (69.2%), Snake (79.0%) and upper Columbia (84.5%) stocks. Differences between steelhead stocks were minor.

At least 1.9% of chinook salmon and 6.9% of steelhead strayed into non-natal tributaries within the hydrosystem. Steelhead from upper Columbia and Snake River sites strayed at comparable rates, but Snake River fish tended to stray into Oregon-shore tributaries and upper Columbia fish mostly strayed into Washington-shore tributaries. Snake River chinook salmon and steelhead that were barged as juveniles homed at lower rates and strayed at higher rates than fish that were not barged.

Chinook salmon from the Snake River were reported harvested in the lower Columbia River at higher rates (10.8-12.1%) than upper Columbia stocks (3.6-4.0%) in 2001 and 2002, in part reflecting higher fishery effort during the spring runs. In contrast, upper Columbia steelhead stocks were harvested at higher rates (13.8-14.3%) than Snake River stocks (8.7-10.6%). About 7.8% of chinook salmon and 10.5% of steelhead were last recorded in the hydrosystem downstream from Lower Granite/Priest Rapids dams and had unknown fate. Proportions of fish with unknown fate were generally similar between same-species stocks except in 2001, when large differences were observed for chinook salmon from the Yakima (1.7%), Snake (6.2%), upper Columbia (12.9%) and Wind (17.2%) rivers.