SPAWNING SUCCESS OF SPRING CHINOOK SALMON IN FALL CREEK, NORTH FORK MIDDLE FORK WILLAMETTE AND SOUTH FORK SANTIAM RIVERS, 2008-2014

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In recent years, high percentages (80-90%) of adult Chinook salmon transported above dams in some Willamette River tributaries have died prior to spawning. In 2014 we continued to survey the energetic status and prespawn survival rates of three populations of Willamette River spring Chinook salmon, monitored river environmental conditions, and investigated the relationships among prespawn mortality and a suite of potential causative factors.

In 2014, a total of 160 Chinook salmon were sampled at Fall Creek. Fish were collected, assessed for energetic condition, PIT-tagged and then transported above the dam and allowed to spawn naturally. PIT-tagged salmon recovered during spawning ground surveys on Fall Creek, will be used to estimate prespawn mortality rates. The average water temperature during the study period was 16.7 °C with a peak of 21.8 °C occurring in early August.

Two-hundred Chinook salmon collected at the Dexter trap were radio- or PIT-tagged (n=75 radio, n=125 PIT) then outplanted into the North Fork Middle Fork (NFMF) Willamette River in 2014. Prespawn mortality rates of radio and PIT tagged fish recovered on the spawning grounds will be presented. Mean water temperature in the NFMF during the study period was 11.5 °C with a peak of 14.5 °C occurring in mid-July.

As in 2013, we initiated outplanting into the NFMF approximately a month earlier than in previous years. Of the 200 PIT and radio-tagged fish released in the NFMF, 60 (30%) were released between 21-May and 4-June (early release group, hereafter). The remaining 140 fish (70%) were released between 11-June and 30-July (standard release group, hereafter). We will compare recovery and prespawn mortality rates of the early and standard release groups.

We also continued our prespawn mortality study in the South Fork Santiam River upstream from Foster Dam. A total of 174 spring Chinook salmon were radio (n = 75) and PIT-tagged (n = 99) then transported upstream from the dam. PIT and radio-tagged fish recovered on the spawning grounds will be used to calculate prespawn mortality rates. Of the 75 radio-tagged

fish, 44 (59%) were released in Foster Reservoir. Of the 44 fish released in the reservoir 21 (47.7%) fish were last recorded in the South Santiam, 12 (29.5%) in the Middle Fork Santiam and 10 (22.7%) fell back over Foster Dam. Mean reservoir duration times for fish last recorded in the South Santiam River was 11.4 d (n=21) and 12.8 d (n=6) for fish last recorded in the Middle Santiam River. Time from release to fallback ranged from 0.6 to 31.6 days. Mean water temperature in the South Santiam during the study period was 15.2 °C with a peak of 19.3 °C on 2-Aug.

In 2014, we initiated a study at Minto Dam on the North Santiam River to determine spawning ground distributions and fallback rates of unmarked Chinook salmon. Of the 50 fish tagged and released at the Minto Fish Facility, 40% fell back while 24% were last detected in the Big Cliff Dam tailrace. Although telemetry data was limited, most of the remaining fish were last detected 1-2 km upstream from Minto Dam. In a separate sample of 300 fish radio-tagged at Willamette Falls, 10 (3.3%) were detected upstream of Minto Dam. Of these 10, six fish (60%) fell back over Minto Dam.