

Age at ocean entry of Snake River Basin fall Chinook salmon and its significance to adult returns prior to summer spill at Lower Granite, Little Goose, and Lower Monumental dams

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Prior to 2002, it was largely assumed that juvenile Snake River Basin fall Chinook salmon migrated seaward during summer and fall and entered the ocean as subyearlings. Research published in 2002 and 2005 provided the first peer-reviewed evidence for yearling migration and ocean entry, respectively. It has been difficult to characterize, understand, and incorporate this alternative juvenile life history into management and research paradigms. The goal of this briefing is to use existing data collected primarily during migration years before the summer spill program began to: (1) describe age at ocean-entry for the Snake River Basin population of full-term wild adults; (2) describe age-at-ocean entry for transported subyearlings; (3) describe age-at-ocean entry for in-river migrants; and (4) summarize the limited information on smolt-to-adult return rates (SARs). The following key points will be made acknowledging the limitations and assumptions inherent to the findings. Both subyearling and yearling migrants made substantial contributions to the return of full-term wild adults. Subyearling and yearling ocean entry was evident in full-term adults from summer and fall transport groups as well as in-river migrating groups. The tendency to become a yearling ocean entrant increased as the migration season progressed. There was also an increase in SARs as the migration season progressed. One plausible explanation for the seasonal increase in SAR is that many freshwater and marine predators were too small to consume the much larger late subyearling and yearling migrants. We conclude that: (1) during years when summer spill was not fully implemented at Snake River dams, subyearling and yearling migrants made substantial contributions to adult returns regardless of how they reached the sea; (2) the relatively high SARs for late migrants destined to become yearling ocean entrants likely compensated for a high rate of mortality during early rearing; (3) the relatively low SAR for early migrants destined to become subyearling ocean entrants may or may not have been a function of in-river conditions (i.e., no summer spill). Determining the effects of summer spill on SARs of in-river migrating subyearling ocean entrants is an important area for future research.

REFERENCES

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