

**Looking for Pieces of the Puzzle:  
Life History of Spring Chinook Salmon in the Willamette Basin**

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Spring Chinook salmon in the Willamette River basin have been listed as a threatened species under the federal Endangered Species Act. Dams constructed for flood control blocked access to historical spawning and rearing areas, and have altered patterns of water temperature and flow. Recovery of spring Chinook salmon depends on understanding life history patterns and how life histories may be affected by environmental changes. We have begun to piece together a picture of the diverse expression of life histories in Willamette spring Chinook using a combination of investigative studies primarily through the use of PIT tags and field observations. Juvenile fish migrate from spawning areas into the lower reaches of large tributaries and the main stem of the Willamette River as fry (late winter-spring), subyearlings (spring-summer), and yearlings (fall-spring). Significant numbers of juvenile fish emigrate from the Willamette River as subyearlings after a short rearing period, whereas other fish rear in the river through summer and winter as subyearlings before emigrating in the following spring as yearling smolts. Yearling smolts that rear closer to spawning areas spend a shorter amount of time in the Willamette River than the other life histories. Juvenile Chinook salmon have been captured in the winter in intermittent streams and seasonally flooded areas, up to 30 km from the Willamette River. The proportion of returning adults with a subyearling or yearling life history is variable between years and among subbasins. Our studies illustrate the use and constraint of PIT tag technology in a large river system to study life histories, and how information from recoveries of PIT tags have increased our knowledge of life histories.