

**Response of a spawning population of spring Chinook salmon to flow alteration in a highly regulated system.**

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The Yakima River is a hydrologically regulated system managed to balance the needs of irrigation while sustaining populations of spring Chinook salmon (*Oncorhynchus tshawytscha*). Each Autumn, coincident with spawning, flow is significantly and abruptly reduced in the upper Yakima River, while during the summer the hydrograph is artificially high. We used radio telemetry to document movements of adult spring Chinook salmon in the upper Yakima River during flow alteration. Adult salmon (total length 60-93 cm) were collected in June as they migrated into the upper Yakima River, implanted intragastrically with radio transmitters and released 7 km upstream of the collection site. Radio-tagged fish were relocated using a combination of fixed site receivers and mobile tracking surveys. Several fish migrated from the release site to points upstream (mean distance 85 km; range, 46-110 km) and moved at a mean rate of 3 km/day (range 0.5-6.2). Of these fish, most were last relocated in areas of historically high spawning density and a proportion of radio tags were recovered in the carcasses of post-spawned fish. Decreased flows appear to have prompted some fish to move upstream and preliminary results have management implications related to flow reduction timing, ramp-down rates, and maintenance of minimum flows.