

Improving Fish Survival at The Dalles Dam: The Other Great Wall

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The U. S. Army Corps of Engineers (Corps) and regional salmon managers have been working to improve fish survival at The Dalles Dam for more than two decades. Numerous fish passage studies and engineering evaluations have taken place, including evaluations of spill operations, design of a juvenile bypass system, operation of the sluiceway to pass fish, surface flow bypass studies and designs, surface spill, design of a fish guidance curtain, and predator / prey studies. Knowledge gained from these efforts pointed to improving spillway survival as the best opportunity for increasing overall dam passage survival at The Dalles Dam. Past studies demonstrated that at 40% spill, approximately 80% of all juvenile salmonids pass through the spillway. However spill passage survival was 5 to 7 percent lower than observed at other mainstem Snake and Columbia river dams. Primary suspects for low spillway survival were direct injury within the very shallow stilling basin, and predation by northern pikeminnow and smallmouth bass directly downstream of the spillway. In 2001 the Corps initiated biological and hydraulic model studies to develop and test alternatives to improve the stilling basin hydraulic conditions and downstream egress of fish that pass through the spillway. This effort ultimately led to construction of an 800' long wall that extended from the spillway (between bays 8 and 9) to the original river thalweg. The spillway was completed in 2010 and dam passage survival was evaluated. Survival estimates were 96.4% for yearling Chinook, 95.3% for steelhead, and 94.0% for subyearling Chinook. This equates to a 3-5% increase in overall dam survival compared to the "current condition" survival estimated by NOAA Fisheries in the 2008 Biological Opinion on the Operation of the Federal Columbia River Power System (BiOp) and by the Action Agencies in their Biological Assessment. Importantly, the 2010 estimates exceed BiOp dam survival performance standards for Chinook and nearly meet them for steelhead. In addition, the proportion of fish passing through the spillway was the highest ever observed at The Dalles Dam and adult fish passage through the North Shore Ladder improved. A second year of testing is planned for 2011.