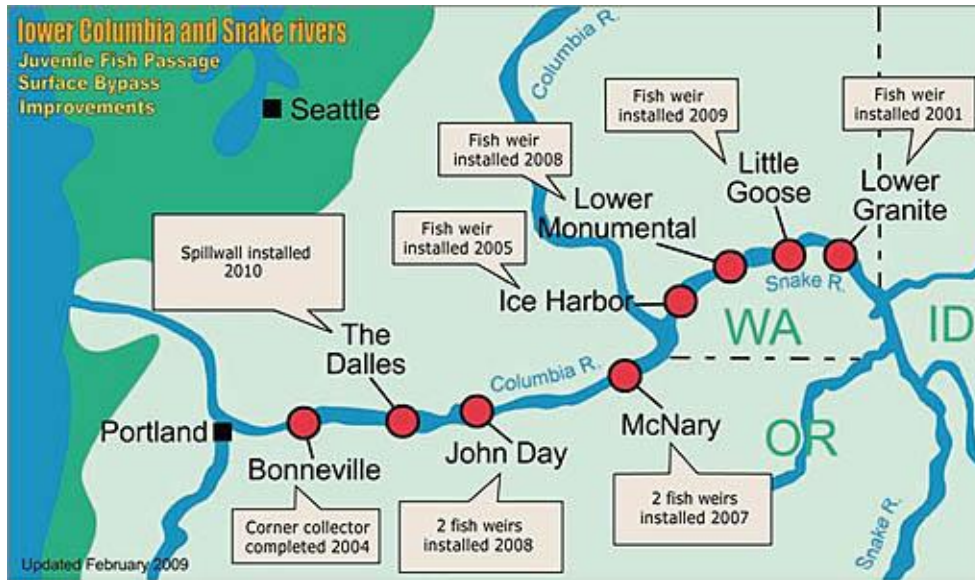




Salmon ride smoothly through eight dams this year



Young Northwest salmon and steelhead migrating toward the ocean will benefit for the first time this year from easier, safer routes through all eight lower Snake and Columbia river dams.

The improved passage routes will help promote fish survival in what is expected to be one of the Northwest's driest years on record. Fish protection regularly takes priority over power generation in the daily operation of hydroelectric dams that provide much of the region's electricity. But the improvements also demonstrate extensive upgrades of dam facilities to benefit fish.

The new routes let fish stay close to the water's surface, where they instinctively swim. Young fish now survive their downstream trip through the dams at rates as good as or better than in the 1960s, when only four dams stood on the lower Columbia and Snake rivers. Survival now is nearly twice as high as in the mid-to-late 1970s.

The improvements are buttressed by spill of water to help fish safely pass dams and increased water releases to boost flow when young fish are migrating.

The **U.S. Army Corps of Engineers** since 2000 has invested almost \$800 million in improvements at the federal dams for fish passage. Congress appropriates funds to the Corps for the projects and BPA ratepayers reimburse the U.S. Treasury for about 80 percent of the cost, which has totaled about \$640 million since 2000.

If the success of the improvements continues, the federal hydro system should meet its goal of safely moving an average of 96 percent of spring chinook and steelhead and 93 percent of sub-yearling fall chinook past each dam. The goal is outlined in the federal strategy, called a Biological Opinion, for protecting salmon and steelhead listed under the Endangered Species Act.

"The results have been very encouraging," said Mike Alder, federal hydro projects operations and maintenance manager for BPA. "With the weirs and other passage improvements, we are increasingly confident that we can consistently meet or exceed our BiOp targets for safe downstream fish migration. It's a real success story."

Engineers examined each dam individually and applied lessons learned at each project to the next. Here are highlights of how the system has been overhauled for fish in the last decade.

Weirs carry fish past six dams

Young migrating salmon traveling near the water's surface now slide over the four lower Snake River dams plus McNary and John Day dams on the Columbia via **spillway weirs**. Standard spillways require fish to dive 50 to 60 feet below the surface to find their way through, but the weirs let fish remain near the surface and pass in a quicker and less-stressful ride. While more than 97 percent of juveniles survived passage through the standard spillway at **Lower Monumental Dam** in 2008, virtually 100 percent survived passage through the fish slide there.



The smooth green water of a fish weir (closest spillway) lets young salmon slide over a dam in the surface water they prefer. (Corps of Engineers photo)

Bonneville Corner Collector

A sluiceway at Bonneville Dam has been reconfigured into a very successful fish-passage route. Virtually 100 percent of the young salmon and steelhead survive passage through this "corner collector." The \$50 million renovation, completed in 2004, includes a 2,800-foot transportation channel, a 500-foot outfall channel and a plunge pool to move fish into fast-moving water beyond the predator-infested zone just below the dam. Screens at the dam's second powerhouse ensure 95 percent of fish headed for the second powerhouse pass through the corner collector.

The Dalles Spillwall

The most recent improvement is a "spillwall" installed on the downstream side of The Dalles Dam, which is expected to boost fish passage through the dam up to or beyond the BiOp standards. "The Corps found that the most difficult point for fish at The Dalles was shallow water and confused currents just downstream," Alder said. "The solution was a spillway wall below the dam to guide fish quickly to deeper, safer water." The Corps completed the spillwall just in time for the 2010 fish migration season. The spillwall is expected to increase juvenile fish survival by 3 percent to 5 percent, making The Dalles to one of the safest dams on the Columbia for fish.

While the new surface passage routes have involved major investments and brought major improvements, they are neither the first nor the last revisions the Corps will make with BPA support and funding to help fish through the hydro system. BPA works with the Corps to identify and advance the most effective dam improvements. For instance, the Corps recently awarded a **\$10.9-million contract** funded by BPA for design of a new turbine system at Ice Harbor Dam that will be safer for fish.