

Current Reflections

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Investing in salmon: Efforts to help fish are succeeding

Operators of our region's clean, renewable hydrosystem have worked hard to restore migrating fish populations, and Northwest families and businesses invest nearly \$800 million annually toward the effort. Today both can take pride that their efforts and investments are paying off.

While much remains to be learned, recent biological studies indicate that Columbia River salmon and steelhead runs are improving, evidenced by very strong returns of spawning salmon in recent years.

According to National Oceanic and Atmospheric Administration (NOAA) Fisheries data, juvenile fish survival past the dams has improved so much for spring/summer Chinook, that they are now comparable to the 1960s, before the dams were built on the lower Snake River.

Hydro isn't solely responsible for past declines in spawning fish populations, but it certainly has had an impact.

Taking responsibility and taking action

Decades ago, the drop-off in salmon runs were due to overharvesting, not the dams. Dam builders were not oblivious to salmon. They incorporated fish ladders at the dams so adults could migrate back to their spawning grounds. But there's no doubt that the development of the region's hydroelectric system added to the pressure on fish runs that were already being ravaged by loss of habitat and overfishing.

Today, the federal Columbia River hydro system is being operated to give top priority in almost all circumstances to fish passage and survival (more at the link, *Managing the Columbia River system to help fish*). Salmon migration, not flood control or power production, is the driving force behind planning hydro operations throughout the year for the Columbia and Snake river dams.

Therefore, dam operators on the Columbia and Snake rivers have engaged in a multilayered effort using a number of tools to help listed fish pass and survive in their upstream and downstream journey through the dams:

High efficiency turbine upgrades – These are resulting in survival rates for young fish moving downstream of more than 95 percent. Mechanical bypass systems often are installed in front of the turbine intakes, and can divert 70 to more than 95 percent of the juveniles through or around a dam.

Transportation – The Corps of Engineers (Corps) has been transporting fish around the dams since 1968. Over time, the transportation program has become much more sophisticated, and is tailored to meet the needs of individual stocks, timing of runs, etc., which has resulted in high survival rates. Survival is 98 percent for juveniles transported to a release point below Bonneville Dam.

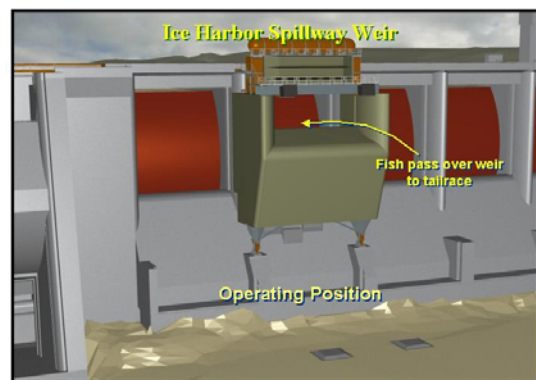
Changing operations – Hydro operators change operations to increase or reduce flows from the reservoirs in order to aid fish passage, or to provide for spawning and rearing protection. For example, floodwaters are held in storage reservoirs in the winter then released in the summer to provide cool water for salmon migrating to the ocean in the summer.

Surface bypass – These systems are creating excitement among operators and fish biologists, as fish survival is almost 100 percent with those systems in place. That's higher than using spill at many dams, and easier on the fish. Surface bypass allows fish to pass over instead of through the dam on their way to the ocean. This process does not subject the salmon to the potentially fatal high pressures, rapid pressure changes and high velocities they typically face with increased spill or when they have to dive 50 feet or more beneath the surface of the water to reach conventional dam passage entrances.

Removable Spillway Weirs (RSW)

This dam-passage improvement allows migrating salmon to enter a dam's spillway close to the surface of the water and exit by way of a gradually slowing discharge chute or fish slide. Removable Spillway Weirs were installed at Lower Granite and Ice Harbor dams on the lower Snake River with more installations planned. They are spendy: about \$20 million each, but effective.

Another type of surface passage - a corner collector at Bonneville Dam - is achieving 100 percent survival. In 2003, the RSW was recognized as the best engineering achievement in the nation.



Top-Spill Weirs (TSW)

This fits in the existing spillway gate wells, and is cheaper than RSWs with an estimated cost of \$2 million each. This month, a TSW was installed in the McNary Dam spillway gate well. The Corps will begin releasing fish over the structure to test fish passage survival before the spring salmon runs start in April. If biological testing proves the safety and effectiveness of the TSW, a second structure will be installed and both TSWs will be operated throughout the spill season.

Summer spill – During the past two summers, Snake and Columbia River dam operators have been spilling water during summer months in court-ordered efforts to help increase the survival of endangered fish. However, it's not ideal because the order requires summer spill whether or not fish are actually passing through the dams, which wastes needed energy. And, other methods as described above often provide higher survival benefits. In 2006, the BPA calculated more than \$397 million in lost opportunity costs – which is “lost” electricity and money that could have been generated if the water had passed through the turbines.

Predator control – Removing northern pikeminnow from the Snake and Columbia rivers has cut predation on juvenile salmon by about 30 percent. Also, predatory birds and sea lions are a much bigger problem for salmon than previously thought. Recent legislation created an expedited process for Washington, Oregon and the four Columbia River treaty tribes to obtain permits for the lethal removal of a limited number of California sea lions preying on salmon and steelhead in the Columbia River.

Electric customers are contributing to the solution

Northwest homes and businesses may not know it, but they are the largest contributors to the protection and recovery of endangered salmon in the region. Nearly one-third of BPA's wholesale energy prices to utilities pay for salmon programs and improvements described above. This translates into about 20 – 25 percent of every electric bill going toward salmon recovery.

The Bonneville Power Administration (BPA) reported this week that in 2006, it invested nearly \$852 million for its fish and wildlife effort – over \$5 billion since 2000. These costs include the improvements in operations and facilities described above, funding 300 fish and wildlife projects in the Columbia Basin, the cost of lost generation due to spill, and the power purchases required to make up for that lost generation.

Steve Wright, administrator of the Bonneville Power Administration, recently said, “BPA has a clear, statutory mandate to mitigate for damage to fish and wildlife caused by federal hydro, and we intend to be successful at that mission.”

While BPA covers the lion's share of costs, other federal, state and local agencies also put dollars into protection and mitigation programs. BPA pays about 80 percent of the cost of fish mitigation projects at the dams. The Army Corps of Engineers funds the remaining 20 percent. NOAA provides the region about \$100 million per year for protection and enhancement of ESA listed salmon and steelhead stocks. The states and Tribes also fund a variety of salmon enhancement projects in the region.

More sustainable solutions are needed

A frustrating aspect to salmon recovery is that so much attention is being paid to hydro without adequate consideration of other factors affecting fish survival. Dam improvements alone will not provide a sustainable solution. Many factors affect the salmon throughout its complex lifecycle – **hydro, habitat, harvest and hatcheries** – and these must be addressed together to achieve sustained improvement. In fact, some are voicing concern that not enough attention has been paid to further restricting commercial fishing, considering that salmon are the only endangered species that is harvested.

Another extremely important factor in survival is ocean conditions. According to NOAA, no matter how healthy the rivers, salmon will falter under negative ocean conditions.

An enormous amount of knowledge about salmon has been gained in recent decades. Dam operators and biologists have been putting this knowledge to work in ways that both preserve fish and maintain our clean, renewable hydro resources. People in the Northwest should know how their dollars are being invested, and be proud of their role in salmon recovery.

Links:

[Managing the Columbia River system to help fish](#): Throughout the year, the Columbia River system is carefully operated to help juvenile fish survive passage through the dams and reservoirs.

[Northwest RiverPartners](#) – dedicated to ensuring that the Snake and Columbia rivers remain living, working rivers.