



How the Columbia River is Managed to Help Fish Migrate

Beginning around mid April and continuing through August, the Columbia River system is carefully manipulated to help juvenile fish migrate to the ocean. The timing coincides with natural migrations of anadromous fish such as salmon and steelhead that are born in fresh water but migrate to the sea where they spend their adult lives until they return to their natal waters to spawn.

The operational activities embrace a complex set of river operations that are aimed at helping juvenile fish traverse dams and reach the ocean in a timely and safe manner. Specifically, the activities support protection and recovery efforts for 13 salmon and steelhead populations in the Columbia and Snake Rivers listed as endangered or threatened under the Endangered Species Act.

In addition to listed fish, these operations also generally aid all migrating smolts in the river as well as some resident (non-migrating) fish.

The 2004 biological opinion issued by the National Oceanic and Atmospheric Administration (NOAA) Fisheries lays out the specific operational steps that are carried out by what are called the “action agencies”— the U.S. Army Corps of Engineers, U.S. Bureau of Reclamation and BPA.

These operations are not static. Rather, they are carefully choreographed by the action agencies to respond quickly to changing water and temperature conditions and to the migratory patterns of the fish. The idea is to provide the greatest benefit when the most fish are in transit in the river. Key river operations include the following:

Spill

Spill is designed to help fish pass dams safely. Water isn't actually spilled over a dam, but rather fish-laden water is released through a spillway that avoids the dam's turbines. In average water condi-

tions, water is spilled during spring and summer to encourage in-river migration. More spill is not necessarily better because too much falling water can trap nitrogen bubbles that cause an illness in fish similar to “the bends” in humans.

Flow Augmentation

Each year, coordinated water releases from upstream storage reservoirs augment flows during the juvenile migration. The purpose of flow augmentation is not to help fish traverse a dam but rather to create an artificial freshet that helps speed fish on their journey between dams and to the sea.

Transportation

In addition to those smolts making the journey in river, other smolts are collected at various dams and transported via barges through Snake and lower Columbia River dams for release below Bonneville Dam to complete migration to the sea. There is evidence that transportation is especially effective in dry years, such as 2001. During such years, spill can be decreased, allowing more fish to be transported.

Flows/Water Releases

Water may be released or withheld from individual dams for a variety of reasons: to provide safe water temperatures, to minimize water fluctuations to keep redds watered and to ensure hatchlings aren't stranded by water that is too low. Other flow operations may not be related to fish; for example, keeping reservoirs at sufficient levels for holiday recreation and to provide for bird nesting.

Dam Configuration

For more information, view the Action Agencies' water management plan at <http://www.nwd-wc.usace.army.mil/tmt/documents/wmp>.

