US Army Corps of Engineers®
Walla Walla District

Spillway Weir

Most Columbia River Basin juvenile anadromous salmon and steelhead tend to stay in the upper 10 to 20 feet of the water column as they migrate downstream to the ocean. Juvenile fish passage routes at the Corps' lower Columbia and Snake river dams, because of the dams' configurations, cause the juvenile fish to dive to depths of 50 to 60 feet to find the passage routes. Engineers and biologists for the past several years have been pursuing new technologies that would provide more surface-oriented, less stressful, passage routes for juvenile fish.

A prototype spillway weir was installed at Lower Granite Dam on the lower Snake River in 2001. The spillway weir, or fish slide, allows juvenile salmon and steelhead to pass the dam near the water surface under lower accelerations and lower pressures, providing a more efficient and less stressful dam passage route.

The design of the spillway weir is different from existing spillways whose gates open 50 feet below the water surface at the face of the dam and pass juvenile fish under high pressure and high velocities. The fish slide passes juvenile salmon and steelhead over a raised spillway crest, similar to a waterslide. Juvenile fish are safely passed over the weir more efficiently than with conventional spill while reducing migration delays at the dam.

The structure also is designed to be "removable" by controlled descent to the bottom of the dam forebay. This capability permits returning the spillway to original flow capacity during major flood events.

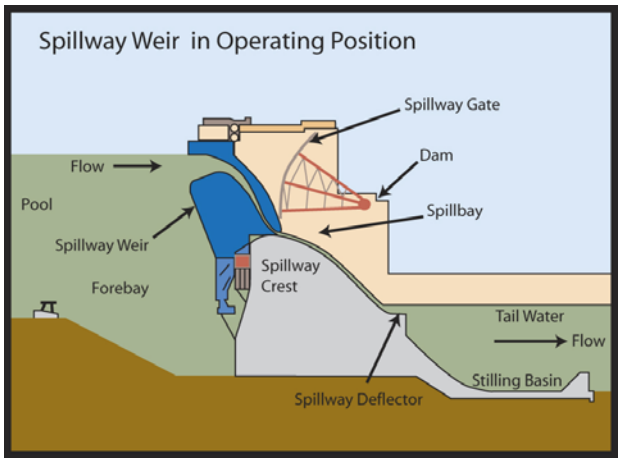
A spillway weir for Ice Harbor Dam has been completed, installed and is currently being tested. A surface bypass structure is currently being designed for Lower Monumental Dam and is scheduled to be tested in 2007.

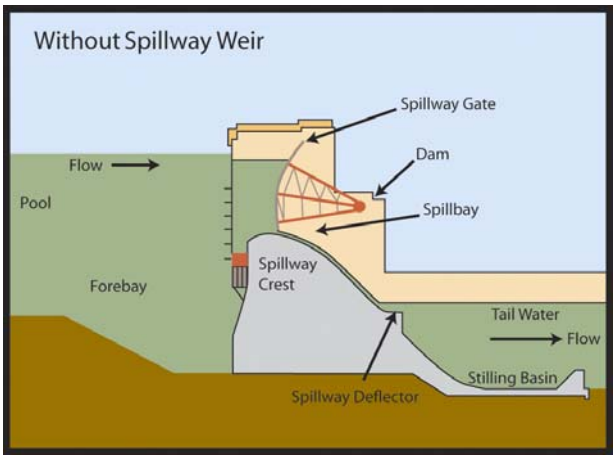
ICE HARBOR SPILLWAY WEIR STRUCTURE

•Design Team: Walla Walla District, U.S. Army Corps of Engineers, Jacobs Civil Inc and Lund Engineering,
•General Contractor: DIX Corporation, $12.8M fabricate, deliver and install.
•Steel Fabrication and Assembly: Thompson Metal Fabricators (TMF)

A spillway weir was installed at Ice Harbor Dam in February 2005.

SIZE:
•105 feet tall
• 70 feet wide
• 1.7 million pounds





SPILLWAY WEIR CONCEPT

The Spillway Weir is a juvenile fish passage structure designed to safely bypass fish in-river via a modified spillway. Surface flow offers better attraction because juvenile fish tend to be surface oriented. The spillway weir provides a safe and efficient passage route for juvenile salmon and steelhead.

- Adult fish pass the dam using ladders, upstream passage
- RSW offers a fish "slide" for juvenile fish passage downstream
- Adding a door through the dam to improve in-river passage

SPILLWAY WEIR ADVANTAGES

- Safe (Lower Granite tests showed 98% survival)
- Reduces reservoir delays (Reduces forebay residence time)
- Improved efficiency of passages (more fish with less flow)
- If less flow, opportunity to improve water quality (lower river total dissolved gases)
- If less flow, improves the opportunity for power generation

DIFFERENCES FROM CONVENTIONAL SPILL

HOW water and fish are passed (surface "overflow" versus under deep gates)
HOW MUCH flow is required (less flow is required to pass comparable numbers of fish)

REMOVABLE

To maintain flood flow capacity at the spillways, the massive structure can be "removed" by controlled sinking

FOR MORE INFORMATION

Websites:

- Spillway Weir: http://www.nww.usace.army.mil/spillway_weir/default.html
- Fish Recovery Efforts in the Region: http://www.salmonrecovery.gov/