



PROJECT BRIEF

Acme Early Chinook Restoration Project

Background

The South Fork Nooksack River provides essential spawning and rearing habitat for the South Fork population of spring Chinook salmon that is threatened with extinction and protected under the federal Endangered Species Act. Addressing habitat limitations by restoring key habitat functions for spring Chinook is the top priority in the local salmon recovery plan. One limiting factor, high summer water temperatures, is of particular importance and is a driver for many of the on-going salmon recovery projects completed in recent years.

Spring Chinook are so named because they return from marine waters in the spring to early summer seeking their natal streams. Adults can hold for a month or more prior to spawning in August and September. High water temperatures induce stress and promote bacterial infections that annually claim adult Chinook before they have chance to spawn. Deep pools formed by log jams and overhanging trees and shrubs along the riverbank help to cool water temperatures. However, these features are lacking along the river due to historic land-use practices such as timber harvest and conversion of the floodplain to farmland.

In the past, naturally occurring log jams were common throughout the Nooksack River. These accumulations helped to stabilize streambanks and create habitat for fish and wildlife. Engineered log jams as a bank protection treatment are still considered experimental, but are becoming increasingly popular because they can integrate fish-habitat restoration with flood hazard management.

Engineered log jams are also one method of restoring the complex pool habitat that is lacking in the South Fork. Jams are being strategically placed along the

length of the lower South Fork from Skookum Creek to the mouth with a priority on areas where cool groundwater enters the river. The pools produced provide stopping over points spaced so adult salmon can rest in relative safety and comfort as they work their way upstream. The jams can also shape the streambed downstream of the pool to create the conditions that are just right for salmon to dig redds (nests).

An example of a project that seeks to integrate measures of habitat restoration and flood hazard reduction benefit is found at a small section of the South Fork Nooksack upstream of the Highway 9 Bridge near the town of Acme. The streambank along the outside of the bend has experienced chronic bank erosion problems in recent years. Log jams naturally accumulate at this bend and local residents had enhanced those jams by cabling additional trees for many decades. The pools produced were a favorite hiding place for spring Chinook. However, the jams have deteriorated and the pools and cover have been reduced or lost. In an effort to protect the riverbank from erosion while enhancing salmon habitat, Whatcom County Public Works in cooperation with the Whatcom County Flood Control Zone District (FCZD) built a unique engineered log jam project that is designed to address both issues.

Engineered log jams come in many different configurations, the log jams built for the Acme project are collections of large woody debris (LWD), large trees with the roots still attached, which are anchored with boulders and log pilings. The purpose of the log jams is to provide stability by reducing flow velocities and shear stress along the eroding riverbank. This will cause a pool to scour adjacent to the jams and will also create a hydraulic shadow, a

low-velocity zone for some distance downstream that will allow sediment to settle out and stabilize the eroding bank. Smaller wood that would pass downstream may also rack onto the jams increasing their mass and effectiveness.

Overview

Whatcom County Public Works secured a \$64,500 grant to design and another \$588,240 grant to build the project. Both grants were from the Washington State Salmon Recovery Funding Board. The Whatcom County Flood Control Zone District and the Acme VanZandt Subzone provided a 15% cost match. The project was designed by the team of Wilson Engineering and Northwest Hydraulic Consultants. Whatcom County Public Works provided project and construction management. Heavy equipment and labor was provided by Harkness Contracting, Kemp West, and Haines Tree and Spray while Northwest Chipping and Grinding provided the trees.

Timeline

The project was constructed in July, 2009. Planting of all the disturbed areas will be completed by February 2010 and will be done in partnership with Whatcom Conservation District and a corrections crew under the supervision of Whatcom County Sheriff's Department. The site will be monitored for plant survival and structural integrity for the next 5 years. A second phase to the project is being considered for the opposite bank; design of this project is planned for this fall with construction in summer 2010 if design and permitting are complete and funds available.



Eroding riverbank before construction



The same location, after construction.



Aerial photo of entire project site