



PROJECT BRIEF

Lower Canyon Creek Restoration

Background

Canyon Creek is a tributary to the North Fork Nooksack River 2 ½ miles to the west of the town of Glacier. ESA listed Chinook salmon, steelhead, and bull trout (a native char) as well as pink, coho, sockeye, and chum salmon, and sea-run cutthroat trout all use the stream. In the past, half the spawning spring Chinook in the entire North Fork have been found in Canyon Creek. More than 4 miles of stream have historically been accessible to salmon with the heaviest use in the lower 1.2 miles. However, use of the creek by spring Chinook and other salmon has diminished over the last 20 years due to a combination of natural and manmade factors.

The upper Canyon Creek watershed is geologically diverse with areas of natural instability including two very large deep-seated landslides that can episodically feed the stream huge volumes of sediment. Sediment delivered from the upper watershed has built an alluvial fan where the stream enters the relatively wide and flat North Fork river valley. Historic land management, such as logging and forest roads, have exacerbated the natural instability with an increase in landslide frequency and associated sediment delivery to the stream. While much has been done to mitigate these impacts, landslides and road failures can still occur during significant rainfall events such as the “pineapple express” of warm rain and winds following snowfall in the late fall and early winter.

“Rain-on-snow” events happened in 1989 and 1990. The November 1989 storm produced a sediment-laden flood that had a return interval of about 250 years. Two November 1990 storms produced similar results. Large volumes of sediment were delivered to the alluvial fan, filling the stream bed and causing

the channel to shift to the west. Catastrophic damage to fish habitat and the destruction of 4 homes and a section of County road and adjacent private utilities resulted.

In response, the Whatcom County Flood Control Zone District built a large levee in 1994 to provide protection for the Glacier Springs subdivision, a resort, and the Mount Baker Highway. An exposure of bedrock was also blasted and large boulders were placed to further constrict the floodplain in the hopes of keeping the stream pinned to the base of the easterly hillside. These measures initially provided flood relief, but a number of unanticipated results developed.

Since 1994, the bedrock reach has incised and become a barrier to fish passage. How many fish make it upstream varies by species and stream flow. Some years half the spring Chinook make it over the falls. Other years none do leaving just the lower 0.2 miles of stream available for spawning. Pink salmon are typically totally blocked. Meanwhile, erosion has exposed the toe of the levee at the upstream bend near where the homes were destroyed in 1989 and 1990. Both situations warranted further evaluation and possible action.

Overview

Assessments of the geomorphology and alluvial fan risk on lower Canyon Creek (see http://www.co.whatcom.wa.us/publicworks/pdf/riverflood/canyon_creek_final.pdf) led to recommendations including acquisition of properties in high risk areas, standards for new construction, and partial removal and setback of the existing levee. These measures were designed to mitigate risks to human life and safety should a levee breach occur and to reverse the ongoing impacts to salmon habitat.

With these recommendations in hand, the County partnered with the Whatcom Land Trust to purchase repetitive flood loss and undeveloped properties in the high risk zone of the Canyon Creek alluvial fan. Funding sources included a mix of state and federal flood hazard reduction (FEMA) and Salmon Recovery Funding Board sources with local match from the Flood Control Zone District. The acquisition created the opportunity to engage in the restoration design process.

An \$80,750 Salmon Recovery Funding Board grant was used to evaluate alternatives for restoring habitat in the lower mile of the creek. The design was prepared by Herrera Environmental Consultants in 2007. A SRFB grant of \$311,250 was awarded in early 2008 to implement the preferred alternative with construction occurring in July 2009. The FCZD provided a twenty-five percent project match.

During construction, the downstream 520 feet of levee were removed and the new south end of the levee re-established. The levee fill was used to re-shape the removal area and to fill two swales that had directed flow to the Mt. Baker Highway. An old access road was also blocked; combined these will encourage flow to spread out through the mature forest and mitigate effects of the levee removal. The large boulders that had been placed in 1994 to constrict the floodplain were also removed.



July 2009 Levee removal underway

These actions will also provide an outlet should the levee breach upstream allowing water to flow into the low area to the west of the levee. Previously flow would have been trapped and had greater potential to overtop the banks and head toward the highway.



July 2009 Levee removal complete and site reshaped

The site will be replanted during the late winter and early spring of 2009/2010 by the Whatcom Conservation District using a corrections crew under the supervision of the Whatcom County Sheriff's Office.

Timeline

The 2009 work came in under budget, so remaining SRFB grant funds and Flood Control Zoned District match will be used to develop options to accelerate habitat restoration, address lingering passage issues, and to design feasible alternatives(s) to address the potential for a levee breach while providing an immediate habitat benefit. Design is planned for fall 2009 and should conclude in early 2011. Community discussion and input will be important to inform the design process so that final products reflect salmon recovery priorities, protect human life and safety, and are supported by the neighbors. Construction of the next phase could occur in 2011 pending the design process outcomes, permitting, and the availability of funding.