YEAR
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Mill Creek

seven miles northeast of Vancouver city center, overlooking Salmon Creek; along the lower part of Mill Creek corridor, a tributary of Salmon Creek

The project was intended in part to demonstrate the positive impacts of relatively small-scale, low-technology, "hands-on," habitat rehabilitation in stream, wetland and upland environments. Land-use practices within the Mill Creek watershed in combination with the loss of dense streamside vegetation and large woody debris has contributed to the degradation of fish habitat. Habitat restoration was focused within the stream channel, along the adjacent floodplain riparian zone, and on the steep upland drainage slopes.

The cobble/gravel substrate of Lower Mill Creek was embedded because of siltation from upland and streambank erosion. The substrate in the area would otherwise have been useful for spawning salmon and steelhead, which survive in the Salmon Creek system in low numbers. Lack of good stream structure can be attributed to channel widening and the historic removal of large wood from the stream system. The loss of spawning beds due to siltation and lack of instream habitat diversity, especially pools, have been identified as the principal factors limiting the recovery of salmon populations in the greater Salmon Creek basin.

AFTER

(Above) Crib walls and plantings added to support banks

BEFORE

(Upper left) Eroding banks

Rehabilitation on the hillsides and floodplain included the elimination of invasive plant species such as holly and ivy by cutting and uprooting. Streambank erosion prevention devices included the use of log cribwalls; brush, tree or root wad revetments; log brush barriers; and rock or log current deflectors. In addition, soil bio-engineering techniques were used for slope and gully erosion control that included straw secured with jute/coir fabric and stakes, brush mattresses, contour trenches or waterbars, brush/wire dams, woven hurdle fences and log checkdams.

A notable habitat benefit in the area was the preservation of an extensive patch of woody vegetation along the creek corridor. This "linked" upstream and downstream areas by at least a partially intact woody vegetation corridor that can be traversed by many wildlife species. The generally dense tree canopy in most of the project area also moderated water temperatures in this reach of Mill Creek and helped counteract the stream heating caused by much greater channel exposure upstream.

Washington State University installed signs and fencing to prevent, to the best extent possible, vehicle and pedestrian traffic in both active restoration areas and closed-off habitat areas. A formal path through the area linked up with other campus paths. The purpose of the path, however, was for passive recreation, education and research purposes.

Benefits

The project demonstrated the utility of applying relatively small-scale, low-technology "hands-on" habitat rehabilitation in stream and upland environments. Using bioengineering techniques, re-vegetation with native plants and adding large woody debris and structure improved the aquatic system of the creek. The project goal to improve fish and wildlife habitat and lessen bank erosion and sedimentation was accomplished.

Fish habitat and stream health increased due to increasing structure and diversity in the creek and the lessening of erosion and sediment flow into the creek through bank stabilization. In-stream modifications and bank stabilization techniques used on this site can be used as models for other similar projects. It is useful to view other similar projects when under-taking a similar effort.

Budget

Proposed – $70,169
Actual– $62,000
Metro/US Fish and Wildlife grant award – $15,900

Helpful hints – what worked, what didn't

- Expect that the project will take longer than expected, especially obtaining permits.
- Limited funds did not allow for a project coordinator, critical for projects that depend on volunteer labor.
- At the beginning there was high citizen interest. Lack of leadership and coordination, however, took its toll on enthusiasm and subsequent involvement.
- Project quality and integrity were compromised due to lack of leadership and volunteers.
- It is critical to have a project manager who understands the project goals, has some of the technical expertise required to complete the project, is familiar with materials needed for the project and local vendors that can provide them, and can identify, coordinate and supervise citizen participation.
- It is questionable who will continue to monitor and maintain the project.
- All the techniques employed were successful, some with modifications once installed.
- The original plan called for placement of hardware cloth to seal the log on the upstream end, but high sediment content and low stream gradient sealed the deeply embedded log, replacing the need for the hardware cloth. Six months later, the sediment sealing deteriorated. The lesson learned is to always used fabric cloth for sealing.

Timeline and tasks

Winter 1992	Site assessment and project design
May 1992	Prepared and submitted permit applications
August 1992	Received permits for work
September 1992	Placed large boulders within the channel along the banks to provide increased habitat. Installed a 1 meter by 10 meter western red cedar *(Thuja plicata)* log as a channel-spanning weir for the creation of deep pool habitat. Stream degradation had carved out a wider channel than desired for good fish rearing, feeding and spawning habitat. A deflector was created by placing boulders in the channel and back-filling with dirt, creating a new bank and a narrower channel. The new bank was covered and stabilized with coir and vegetated with native trees and shrubs. Created a deep plunge pool where there had been a riffle. Added large woody debris and root wads to the pool to provide cover and protection from predators. Constructed a rootwad revetment along a 20-meter stretch of bank. The bank was collapsing, adding large amounts of sediment to the stream. A revetment made of cedar logs and root wads was used rather than a willow treatment due to the shady nature of this section of creek. Trenches for the revetment installation were dug by hand and by using a small backhoe.
October 1992	Log water bars were installed along a steep old road to lessen erosion
June 1993	Several volunteer weed-removal and planting days
September-October 1993	Ongoing maintenance
December 1993	Repair to weir

Partners

JD White Co., Inc.

Friends of Salmon Creek

Pleasant Valley Middle School

Mt. Vista Homeowner's Association

Washington Department of Fisheries

Lower Columbia Fish Enhancement Group

Bureau of Land Management – Portland

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