

Mashel River Eatonville Restoration Project

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Project Description

The Mashel River is the largest tributary to the Nisqually River that supports endangered Puget Sound Chinook salmon and Steelhead trout. Its contribution to Chinook life history diversity and Steelhead abundance has made it a high priority for restoration of habitat. The river reach through Eatonville was historically a high usage area and presently exhibits the most habitat degradation in the entire basin, and therefore is the focus of a multi-phased project. The goal of this project is to restore salmon spawning and rearing habitat with the help of Engineered Log Jams (ELJ's) in the short-term and riprap removal and riparian protection and restoration for the long-term. This would restore wood loading that would improve channel stability, and increase diversity and quantity of key habitat.

Within the 2.4-mile section of the river, three construction phases (2006, 2007, and 2009) have addressed habitat limitation in the fairly undeveloped "Boxcar canyon" area and the highly impacted "Smallwood Park" area. The approach in the Boxcar canyon reach was closer to a full process restoration in a reach-specific sense. Human development was further removed from the river floodplain and channel-migration-zone and therefore ELJ's were installed that provided in-stream functions but also re-activated the abandoned floodplain and historic side-channel habitat. In the Smallwood Park area closer development and land-use constrained the extent of process restoration to in-channel restoration and minor off-channel components. Extensive habitat and fish monitoring have shown that even with partial process restoration, summer salmon usage and in-stream habitat can be restored and improved upon.

Guiding Principles

The following process-based principles apply to this project:

- Principle #1: Target root causes of habitat and ecosystem change
Although watershed inputs and processes from upstream sources such as increased magnitude and frequency of winter flood flows were not addressed, the response to those changes are being reversed by increased wood loading and removal of artificial bank hardening.
- Principle #2: Tailor restoration actions to local potential
In the undeveloped Boxcar Canyon Reach, ELJ placement was used to re-activate the historic floodplain and channel-migration zone (CMZ) and elevate the river channel. Since a park, a man-made pond, a highway bridge and other developments constrained the historic floodplain and CMZ, a process that created in-stream habitat (i.e. pools, sorted gravel tail-outs, etc.) and year-round/ lower profile side-channels was applied.
- Principle #3: Match the scale of restoration to the scale of physical and biological processes
Lower intensity LWD log jams were installed into the Mashel River on two occasions prior to this project. Monitoring of those has shown the lack of persistence and biological response by these smaller structures. Therefore the full-fledged ELJ design approach was used in the Eatonville projects.

Constraints

In the Boxcar Canyon reach, the project constraints were limited to a downstream highway bridge, and removed residential housing along the right bank. The Smallwood Park reach included a downstream highway bridge as well, but also a man-made pond which posed a hazard on the right bank and a public park along the left bank.

Riparian plantings were limited to natural areas and were limited near housing areas and within the public park. Even after riprap removal, bank protection still needed to be provided by the log jams along both banks in the Smallwood Park reach. These constraints were known from the start so the end result compares well with the initial goals for the project.