

Braided Reach of the Skykomish River Restoration

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Project Description

Our approach to the project, located within a high priority spawning/rearing area of the Skykomish River, was to develop the goals and objectives of process-based restoration through an assessment that:

- a) Identified segments in the reach that are the most and least geomorphically active,
- b) Identified habitats the form the reach, and the way in which they are used by fish, and
- c) Used the collective information to identify a suite of projects at specific locations, each taking advantage of the specific natural processes and habitat characteristics occurring in the environs of each location.

The projects resulting from this analysis had three overarching goals:

- 1) Provide immediate access to side channels and maintain them over time
- 2) Increase mainstem river complexity
- 3) Increase channel length.

The project is full-process restoration, addressing the hydrologic and sediment transport processes at work within the reach and applying restoration actions that influence how these processes work within the reach to achieve creation of the desired habitat structure that supports recovery of listed species. Specifically, the restoration actions seek to increase channel roughness, which influences both hydrology and sediment transport processes.

Such actions will increase channel length, access to side channels, recruitment and retention of large wood, formation of pools, increase in refuge habitat, and sorting of sediment, which will address the major limiting factors – rearing habitat – as hypothesized in the *Snohomish River Basin Salmon Conservation Plan (2005)*. Furthermore, the actions taken to increase in-channel and channel margin roughness will be active at multiple flow regimes (2-year, 5-year and 10-year flows), further increasing their effectiveness and support of salmon productivity.

Guiding Principles

The following process-based principles apply to this project:

- Principle #1: Target root causes of habitat and ecosystem change
- Principle #2: Tailor restoration actions to local potential
- Principle #3: Match the scale of restoration to the scale of physical and biological processes
- Principle #4: Be explicit about expected outcomes, including recovery time

In particular, Principle #2 applies to this project, in that we assessed the potential of this reach and used the habitat-forming processes already in place to restore roughness to the channel.

Constraints

The principal constraints to this project were as follows: a) Hwy 2 and BNSF RR; b) hydrology, based on forest practices and recovery upstream; c) sediment input based on past land-use practices. Other constraints included land ownership and approval, and understanding the project (permitting agencies and grant reviewers).

Principal constraints shaped the project in terms of placement and type of restoration actions. The other constraints affected our management and tactical (on the ground) approach. For example, BNSF Railroad precluded our use of certain side channels that were on the landscape pre-contact. Also, land ownership and willingness to work with the County restricted where we could gain access to the river to do work (though ownership did not affect the projects or their location which were in the river and thus not owned).

The completed project largely reflects the original design approach and appears to be working well. The main change is that implementation is CONSIDERABLY cheaper to construct than anticipated. Where we set aside \$90k for construction of Phase I, we actually spent \$65k, because of site-specific conditions (high slope stability in constructing in-channel roughness features) and a high degree of capability and competence from our County Road Maintenance crew and project manager.

This experience is shaping our approach to other projects, by increasing the use of restoration actions, such as flood fencing, which is being used in other projects in the basin, such as Chinook Bend and Stillwater Floodplain Restoration in the Snoqualmie, as well as with farmers in the Skykomish. Future restoration further downstream is leading into areas where we will experience greater constraints on our type of restoration activities, such as high-value farmland and well-established flood control/diking districts, Restoration opportunities in these areas (particularly for process-based restoration) are significantly constrained.