

# Snohomish River Basin

## An Ecosystem in Transition

### Introduction

In the summer of 2008, Snohomish County Surface Water Management applied for grant assistance under Ecology's new grant program titled Direct Implementation Fund, or more commonly referred to as "DIF." For the past several decades Snohomish County Surface Water Management has worked diligently to rehabilitate several prime historical salmonid habitat estuaries in the Snohomish River Basin. The restoration project, formally titled the Snohomish Estuary Edge Enhancement Project, focuses on the upper extent of the Snohomish River, Norwegian Bay, and Fields Riffle Estuaries. In March 2008, the restoration project was near completion, but a small amount of additional financial help was necessary in order to see the project to completion.



Figure 1. Map of Fields Riffle and Norwegian Bay estuaries.

### Historical perspective

Since mid-1800s, the Snohomish River Basin has undergone significant changes. As Washington State's second largest river basin, the Snohomish River has been subject to diking, channeling, draining, and removal of thousands of acres of prime estuary habitat to create farmland, roads, and homes. These on-going practices have left hundreds of acres of the Snohomish River Basin prone to water quality problems and without complex habitat for fish and wildlife.

The primary goal of the project is to help restore the water quality of both Norwegian Bay and Fields Riffle estuaries. The rehabilitation of the estuaries will also help provide nursery habitat for juvenile salmonids and help them prepare for their transition to saltwater and migration out to the ocean in the late winter and early spring months. The large, woody, debris structures will help to filter pollutant runoff, promote wood recruitment, provide habitat, and help keep water temperatures cool.

### Wetland reconnection

The first major undertaking of the Norwegian Bay and Fields Riffle project was to remove several tons of road fill in order to reconnect forested wetlands with the Snohomish River. After the reconnection, initial observations during high tide events show juvenile salmonids in the reconnected wetlands. In addition, increased beaver activity in the area deepened the water in the inner bay of Fields Riffle to approximately one meter.



Figure 2. Native tree plantings along Snohomish River riparian areas.

## Invasive species removal

Invasive species Japanese knotweed, Himalayan blackberry, and Reed canary grass were removed in order to reestablish native plants. Western Red Cedar and Sitka Spruce were primary tree species planted in the riparian areas. An over-abundance of trees were planted in anticipation of mortality. Snohomish County has estimated that approximately twenty-five percent of the plantings survived.

## Large woody debris

The third major undertaking of this project was to anchor large woody debris and root wads along the shorelines of both estuarine sites. This portion of the project was complete in the spring of 2009. The anchored logs all made it through the winter successfully and acquired several new large pieces of wood during storm events. Also, several species of fish were observed in the structures.

## Future expectations

Rehabilitation of the Snohomish River estuaries will continue to help provide nursery habitat for juvenile salmonids and help them prepare for their transition to saltwater and migration out to the ocean in the late winter and early spring months. The removal of invasive plant species and reestablishing of native plant species, coupled with in-water large woody debris structures, will help to filter pollutant runoff, promote wood recruitment, and help water temperatures meet Washington State water quality standards.

Monitoring efforts this year noted juvenile salmonid use within the reconnected wetland areas during high tide events. The channel between the inner bay and Fields Riffle deepened approximately one meter in depth, primarily due to beaver activity. The development of these activities should continue to allow a more natural ecosystem to evolve and prosper.



**Figure 3. Large woody debris structure.**



**Figure 4. Anchored logs in Snohomish River**

With a survival of rate of only twenty-five percent for native plantings, it is suspected that over-pruning of the root balls is the primary reason for the high mortality rate. A continuing effort to control Japanese knotweed, Himalayan blackberry, Reed canary grass, and any other non-native species is necessary in order for native plants to establish dominance in the area.

The anchored logs all remain intact and have recruited several additional large logs and woody debris from the season's storms and floods. All major tasks of this project are complete, and Snohomish County staff will continue to monitor the project area for the next five years. Based on the success of this project, the county may seek more funding to implement more projects along the Snohomish River.

## **Funding**

Total cost of the project is \$283,000. The Department of Ecology provided \$13,000 through its Direct Implementation Fund. The remainder of the funding was provided by the Salmon Recovery Funding Board with a 40 percent match from Snohomish County.

## **For more information**

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Photos provided by Andy Haas

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