

HABITAT ENHANCEMENT

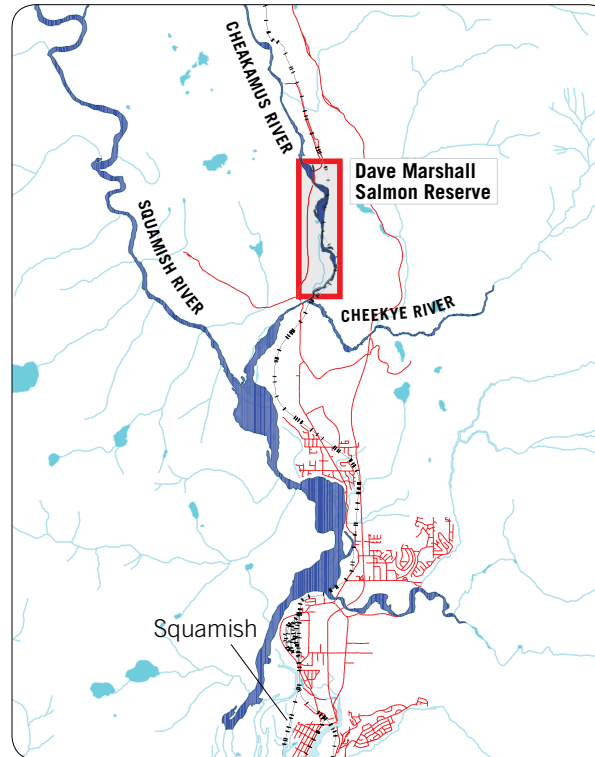
The project involved the enhancement of fish habitat in the side and off channel habitats of the Dave Marshall Salmon Reserve within the floodplain of the Cheakamus River. The four enhanced channels included Mile 49 and Mykiss channels as well as the Gorbusha and Gorbusha East channels.

Many of these channels were damaged by record high water in the fall of 2003. Extensive bedload deposits and infilling of the Mile 49 Channel caused the isolation of the upstream end of the channel making it accessible to fish only during very high water. In addition, the flood damaged or displaced numerous instream large woody debris structures in the two Gorbusha channels.

RESULTS

Habitat enhancement activities resulted in the creation of 35 new cover structures and 43 repositioned structures in the side and off channels for a total of 520 m² of new or improved cover habitat for stream rearing fish.

In addition, channel and refuge pocket excavation in the Mile 49 Channel created 1087 m² of new channel habitat and improved rearing conditions for species that prefer slow moving groundwater habitats including coho salmon and threespine stickleback. Rehabilitation efforts in the Mykiss and Gorbusha channels created improved rearing habitat for species that prefer higher velocity conditions, for example, rainbow trout.



CN remains committed to the recovery of the Cheakamus River and continues to work together with environmental consultants and experts on fish recovery and habitat enhancement.

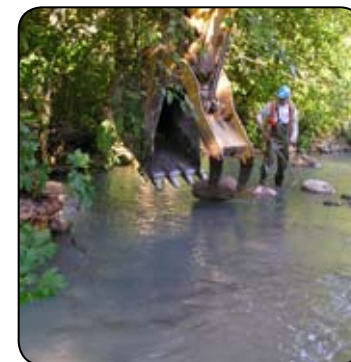
CN Environment is a member of the Cheakamus Ecosystem Restoration Technical Committee (CERTC), which includes additional representation from District of Squamish, Fisheries and Oceans Canada, BC Ministry of Environment and Squamish Nation.

For more information on the recovery of the Cheakamus River, visit www.certc.ca



Habitat Enhancement: Dave Marshall Salmon Reserve

CHEAKAMUS RIVER RECOVERY



MILE 49 CHANNEL

- Extensive excavation to reconnect channel to mainstem and re-establish appropriate pool depths
- Installation of large woody debris structures to increase cover
- Channel widening and excavation resulted in an additional 1087 m² of new wetted channel area



Mile 49 Channel pre-enhancement



Mile 49 Channel after re-wetting

GORBUSCHA AND GORBUSCHA EAST CHANNELS

- Replacement and reconstruction of large wood debris structures to create suitable habitat and desired hydraulic effects
- Gorbuscha Channel
 - Eighteen new cover structures created and 14 structures repositioned to improve function as fish habitat
 - Large boulders placed to enhance juvenile rearing habitat
 - Twenty-boulder clusters positioned to break up flow patterns and maximize foraging and resting areas
 - An estimated increase of 132 m² of available cover habitat for stream rearing fish



Woody debris structure

- Gorbuscha East Channel
 - Two new cover structures created and 39 structures repositioned to improve function as fish habitat
 - An estimated 108 m² of new fish habitat for stream rearing fish

MYKISS CHANNEL

- Channel constructed in 2004, therefore not affected by high water in 2003
- Habitat enhancement included:
 - New large woody debris structures
 - Enhancement of existing structures
 - Boulder placement in selected riffles
- Ten new cover structures created and 2 structures improved to increase fish habitat
- Two types of large woody debris structures installed, each seeded with smaller woody debris to increase complexity
 - Ballasted triangular structure
 - Double parallel log structure



Creating boulder anchors for woody debris structure