

Welcome

Welcome to the fourth Cheakamus Ecosystem Recovery public information session.

4:30 – 6:30 pm Open House

6:30 – 7:45 pm Technical Presentation / Q&A Session

7:45 – 8:30 pm Open House

Please...

- Review the displays and information materials.
- Ask the technical staff any questions you may have regarding recovery programs and activities.
- Fill out the comment form provided.

Thank you for your participation.



CHEAKAMUS ECOSYSTEM RECOVERY

MAKING RECOVERY A REALITY

Stakeholder Team

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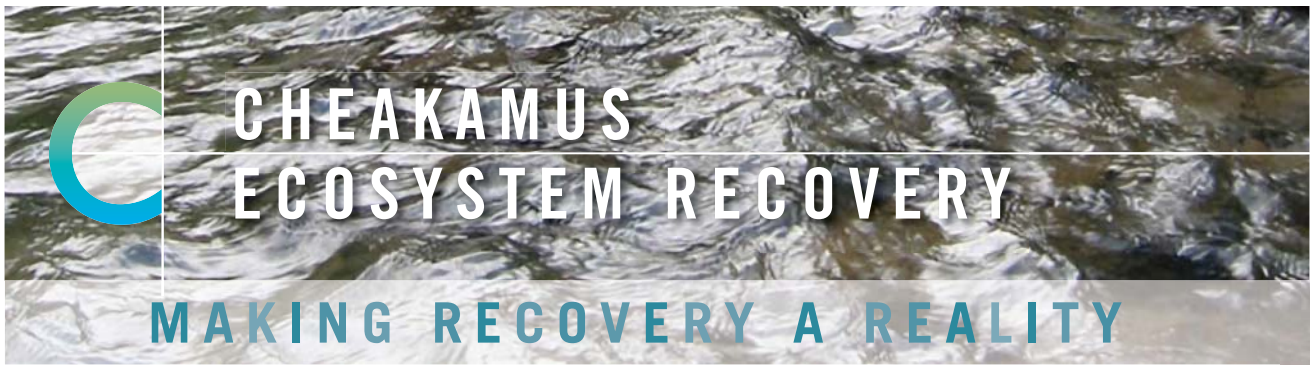
The Cheakamus Ecosystem Restoration Stakeholder Team is a public advisory group comprised of representatives from organizations with an interest in the Cheakamus River, as well as individuals with local knowledge of, and experience with, the Cheakamus River.

Members of the Stakeholder Team provide input into the development and implementation of monitoring and recovery programs for the Cheakamus ecosystem. The Team also helps coordinate and communicate comments and recommendations from interested parties to the Cheakamus Ecosystem Restoration Technical Committee (CERTC), and, in turn, receives updates on CERTC activities.

The Stakeholder Team has met nine times since March 2006, developing and adopting terms of reference, reviewing CERTC activities and providing recovery project suggestions.

The Team is comprised of individual community members and representatives of the following organizations:

- **Angling Guides**
- **BC Federation of Drift Fishers**
- **BC Federation of Fly Fishers**
- **BC Wildlife Federation**
- **North Vancouver Outdoor School (School District #44)**
- **Pacific Salmon Foundation**
- **Seymour Salmonid Society**
- **South Coast Steelhead Coalition (Squamish Chapter)**
- **Squamish Anglers Association**
- **Squamish Downtown Neighbourhood Association**
- **Squamish Environmental Conservation Society**
- **Squamish River Watershed Society**
- **Steelhead Society of BC**
- **Squamish Streamkeepers**
- **Whistler Angling Club**



Next Steps

CHEAKAMUS ECOSYSTEM RECOVERY IS ONGOING

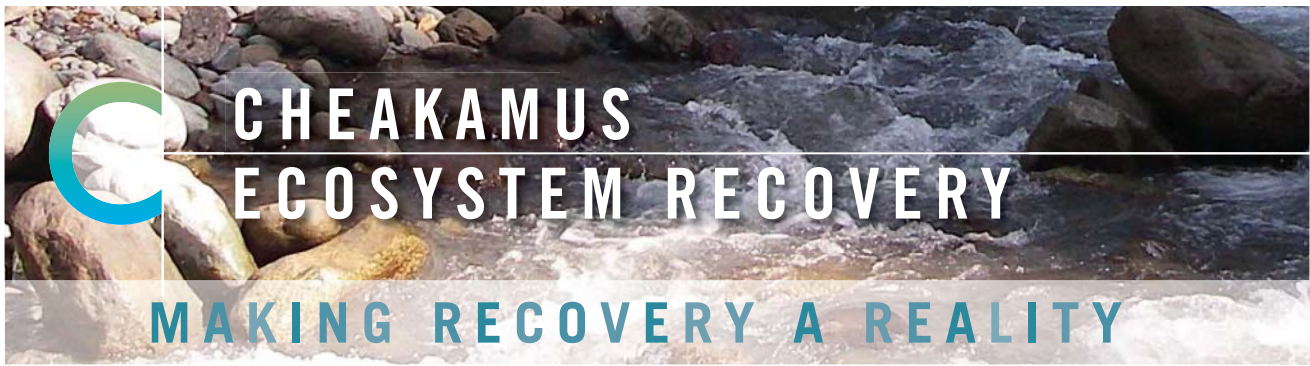
The Cheakamus Ecosystem Recovery Plan (CERP), endorsed by the Cheakamus Ecosystem Restoration Technical Committee (CERTC), is an adaptive management plan designed to remain active until 2016, with annual reviews and more thorough reviews every three years to update the plan, as required.

CN and CERTC are committed to communicating the efforts made to assist Cheakamus.

ECOSYSTEM RECOVERY

To keep up-to-date on recovery programs and activities, including the summaries of CERTC and Stakeholder Team meetings, please visit the CERTC website at **www.certc.ca**.

Thank you for your participation this evening.



Recovery Fund

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CN provides the Cheakamus Ecosystem Recovery Fund to increase community involvement and complement ongoing recovery efforts on the river.

Funds are available to any group, association, agency, university or committee that would like to undertake enhancement, restoration, assessment or education activities on the Cheakamus River from the Daisy Lake dam to the Squamish Estuary.

To date, the following programs have been approved for funding in 2007:

- Assessment of juvenile survival of hatchery-reared coho salmon during downstream migration and early ocean survival – Michael Melnychuk
- Creel survey of the Squamish River watershed recreation fishery – Squamish River Watershed Society
- Squamish River estuary training dyke culvert improvement project – Squamish River Watershed Society

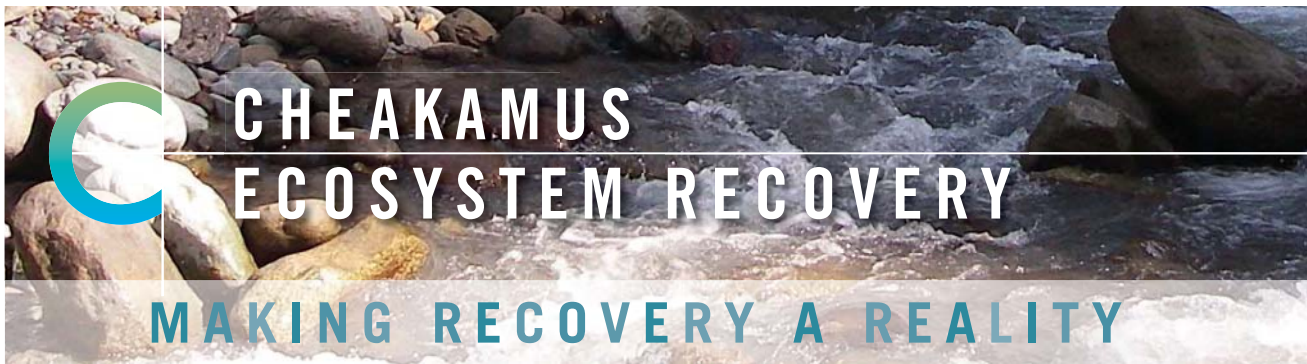
The project review and selection committee is represented by CERTC membership (CN, District of Squamish, Fisheries and Oceans Canada, Ministry of Environment and Squamish Nation). BC Hydro also reviews projects that have the potential to affect BC Hydro's interests on the Cheakamus River.

Recovery Fund application forms are available at the registration desk.

PROJECT SUGGESTION FORM

Individuals also are encouraged to submit suggestions for recovery projects to be implemented by CN.

Project Suggestion Forms are available at the registration desk.



Cheakamus Ecosystem Restoration Steering Committee (CERSC)

FUNCTION: Reviews and approves programs recommended by the Technical Committee.

MEMBERS: Includes representatives from CN, District of Squamish, Fisheries and Oceans Canada, BC Ministry of Environment and Squamish Nation.



Cheakamus Ecosystem Restoration Technical Committee (CERTC)

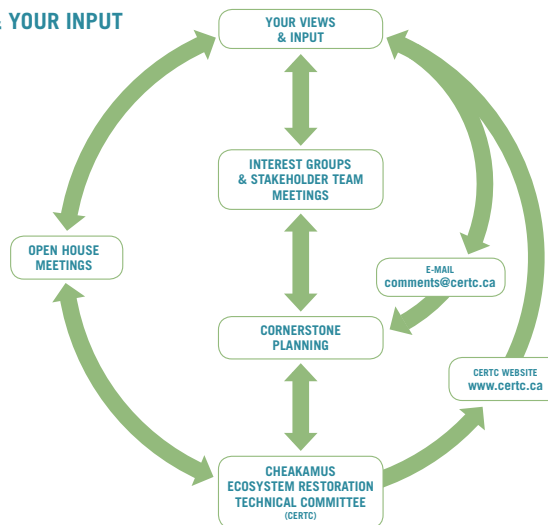
FUNCTION: Recommends programs for implementation based on input from experienced professionals, external specialists, interested parties and the public.

MANDATE: To understand the ecosystem level impacts and develop restoration and monitoring strategies for species affected to accelerate the return of the Cheakamus ecosystem to a pre-spill state as fast as reasonably possible.

MEMBERS: The Technical Committee includes representatives from CN, District of Squamish, Fisheries and Oceans Canada, BC Ministry of Environment and Squamish Nation.

Communications

CHEAKAMUS ECOSYSTEM RESTORATION & YOUR INPUT
INFORMATION PRESENTATION,
FEEDBACK & PROGRAM REFINEMENT





CHEAKAMUS ECOSYSTEM RECOVERY

MAKING RECOVERY A REALITY

Recovery Projects 2006

Fish Habitat Enhancement: Dave Marshall Salmon Reserve

OVERVIEW: Enhancement of existing fish habitat in the Dave Marshall Salmon Reserve by channel excavation and installation of habitat structures to provide cover for juvenile fish.

RESULT: Project resulted in 2287m² of new or improved habitat for stream rearing fish.

ACTIVITIES: **MILE 49 CHANNEL**

- Channel excavation and installation of 7 large woody debris structures resulting in 1956m² of new or improved fish habitat



GORBUSCHA CHANNEL

- Installation or repositioning of 31 large woody debris structures and installation of approximately 20 boulder clusters to enhance juvenile rearing habitat



GORBUSCHA EAST CHANNEL

- Installation or repositioning of 41 large woody debris structures



MYKISS CHANNEL

- Installation or repositioning of 10 large woody debris structures, and installation of approximately 40 boulder clusters to enhance juvenile rearing habitat





CHEAKAMUS ECOSYSTEM RECOVERY

MAKING RECOVERY A REALITY

Recovery Projects 2007

Fish Culture

OVERVIEW: Numerous fish culture programs have been implemented since 2005 on the Cheakamus River as part of the chinook, pink, coho and steelhead recovery efforts.

THE CN-FUNDED FISH CULTURE PROGRAMS:

- Include the eventual release of 3 million fish
- Involve upgrades to both the Tenderfoot and Fraser Valley Hatchery facilities
- Are implemented in co-operation with Fisheries and Oceans Canada and BC Ministry of Environment

STATUS OF THE 2007 CHEAKAMUS FISH CULTURE PROGRAMS:

Species	Goal	Status
Chinook	2005/06 – no egg target 2006/07 – 100,000 eggs 2007/08 – 100,000 eggs	2005/06 – 7,378 fry released 2006/07 – 106,513 fry released 2007/08 – > 85,000 eggs collected*
Pink	2005/06 – 500,000 eggs 2007/08 – 1,000,000 eggs 2009/10 – 1,000,000 eggs	2005/06 – 574,533 fry released 2007/08 – 415,000 eggs collected Hatchery infrastructure improvements in progress
Steelhead	2006/07 – 20,000 smolts 2007/08 – 20,000 smolts	2006/07 – 21,482 smolts released 2007/08 – rearing ~ 18,000 fry
Coho	2007/08 – 80,000 eggs	2007/08 – gamete collection scheduled for fall

* Number of eggs collected as of October 12. Chinook salmon egg collection still in progress.





CHEAKAMUS ECOSYSTEM RECOVERY

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Recovery Projects 2007

Large Woody Debris Demonstration Project

OVERVIEW: A partnership between CN and the British Columbia Conservation Foundation (BCCF) resulted in the completion of a Large Woody Debris demonstration project in the Cheakamus mainstem near the North Vancouver Outdoor School in the late summer of 2007.



RESULT: Eleven triangular large wood structures were constructed to provide rearing habitat targeted at steelhead trout and chinook salmon juveniles. Other species are also expected to benefit from the habitat structures.

Project was completed in cooperation with the North Vancouver Outdoor School and includes evaluation of habitat structure utilization.



Photo courtesy Carl Halvorson, North Vancouver Outdoor School



Photo courtesy Carl Halvorson, North Vancouver Outdoor School

ACTIVITIES: Structures were installed to accelerate natural recovery and mimic natural ecological processes for long-term sustainability.

Project included public consultation and on-site signage to alert recreational users about the location of the habitat structures.



CHEAKAMUS ECOSYSTEM RECOVERY

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Recovery Projects 2007

Km 6.5 Side Channel

OVERVIEW: The km 6.5 side channel project involved re-watering a relic side channel of the Cheakamus River 200 metres downstream of the Paradise Valley Road Bailey Bridge.

The project was completed in cooperation with the North Vancouver Outdoor School (NVOS) staff who provided input to all phases of the project including project design and construction.



RESULT: The project resulted in 1650 m² of new fish habitat with 30 woody debris structures and 48 boulder clusters for stream rearing juveniles (chinook, steelhead and rainbow trout).

Pink salmon adults were observed entering the channel to spawn almost immediately after the channel was re-watered.

Three viewing platforms were constructed to allow educators from NVOS easy access to the channel for educational purposes.

ACTIVITIES: Project took place in four phases

- Channel excavation
- Installation of bank protection
- Habitat structure installation and pool excavation
- Channel reconnection and re-watering



CHEAKAMUS ECOSYSTEM RECOVERY

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Recovery Projects 2007

Cheekye River Fish Passage Improvement

OVERVIEW: This project involved the removal of a remnant concrete apron in the Cheekye River to improve passage for adult steelhead accessing spawning grounds in Brohm Creek.



Before



After

RESULT: The concrete apron was removed in October 2007 and the stream bed was restored to align with the existing channel gradient to address concerns about fish passage.

Wilson Slough Reunion

OVERVIEW: This project involves the installation of a steel culvert to connect the Wilson Slough to the Squamish River estuary to improve water quality and flow, and increase fish passage and usage of the estuarine rearing habitat.

The culvert design focuses on flood control and protection of existing rearing habitat.

Track and road closures are being scheduled to minimize impact to local residents, the Whistler Mountaineer and other rail services.



STATUS: Construction began in early October 2007



CHEAKAMUS ECOSYSTEM RECOVERY

MAKING RECOVERY A REALITY

Monitoring Programs 2007

Measuring Recovery

Several programs monitor fish populations in the Cheakamus River to evaluate the success of recovery efforts. If necessary, recovery strategies are adapted to target species of high priority.

PROGRAMS COMPLETED OR UNDERWAY INCLUDE:

- **Acoustic tracking of hatchery steelhead smolts** – Acoustic receivers monitor the presence of tagged hatchery steelhead to track their movements in the Cheakamus River and Georgia Strait in an effort to determine if smolts are residualizing in the river and to monitor migration patterns.
- **Chinook coded wire tagging** – A coded wire tagging program targeting 2006/2007 chinook juveniles released from the Tenderfoot Hatchery.
- **Non anadromous reach fish abundance monitoring** – Fish sampling using electroshocking and minnow trapping at two sections of the river, one above and one below the spill site, three times per year.
- **Off-channel habitat mark re-capture program** – Evaluation of post-spill juvenile salmonid abundance through mark recapture techniques and density comparisons.





CHEAKAMUS ECOSYSTEM RECOVERY

MAKING RECOVERY A REALITY

Monitoring Programs 2007

Measuring Recovery

Several programs monitor fish populations in the Cheakamus River to evaluate the success of recovery efforts. If necessary, recovery strategies will be adapted to target species of high priority.

PROGRAMS COMPLETED OR UNDERWAY INCLUDE:

- **Resident fish abundance monitoring program** – Twice per year monitoring of resident fish species abundance at typical habitat study sites in order to measure recovery.
- **Adult char enumeration** – Radio tagging and tracking of char to provide information about char life history and develop a reliable measure of recovery through calibrated snorkle surveys. This program also benefits from cooperation efforts with BC Hydro's adult steelhead snorkle surveys.
- **Adult steelhead enumeration** – Enumeration of adult steelhead by BC Hydro using calibrated snorkle surveys. This program also benefits from cooperative efforts and additional snorkle surveys funded by CN's adult char enumeration program.
- **Juvenile salmonid outmigration** – Rotary screw traps at the North Vancouver Outdoor School and fish counters at key side channels provide fish population estimates.





CHEAKAMUS ECOSYSTEM RECOVERY

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Future Recovery Activities

Km 8 Side Channel Re-watering

- CN is cooperating with Fisheries and Oceans Canada to design a new intake near river km 8 to enhance and re-water an existing 600 metre-long side channel.
- This project will help eliminate fish stranding and provide year round habitat for a variety of juvenile and adult fish species.
- The project is currently in the design stage and construction is scheduled for 2008.



Fish Culture

- Fish culture programs focused on recovery of affected species are ongoing.
- In addition to efforts already completed in 2007 for pink and chinook salmon, Tenderfoot Creek hatchery will be collecting an additional 80,000 coho salmon eggs above their annual egg target. This program, funded by CN, will focus on collecting broodstock from the upper Cheakamus River to assist recovery of Cheakamus River coho.



Squamish River Training Dyke Culvert

- This project, funded by the Cheakamus Ecosystem Recovery Fund, will allow the installation of a new culvert to improve juvenile fish access to the central channel of the Squamish Estuary.
- This program complements an ongoing Fisheries and Oceans Canada initiative to improve fish access to important estuary rearing habitat and is scheduled for construction in the winter of 2007/08.



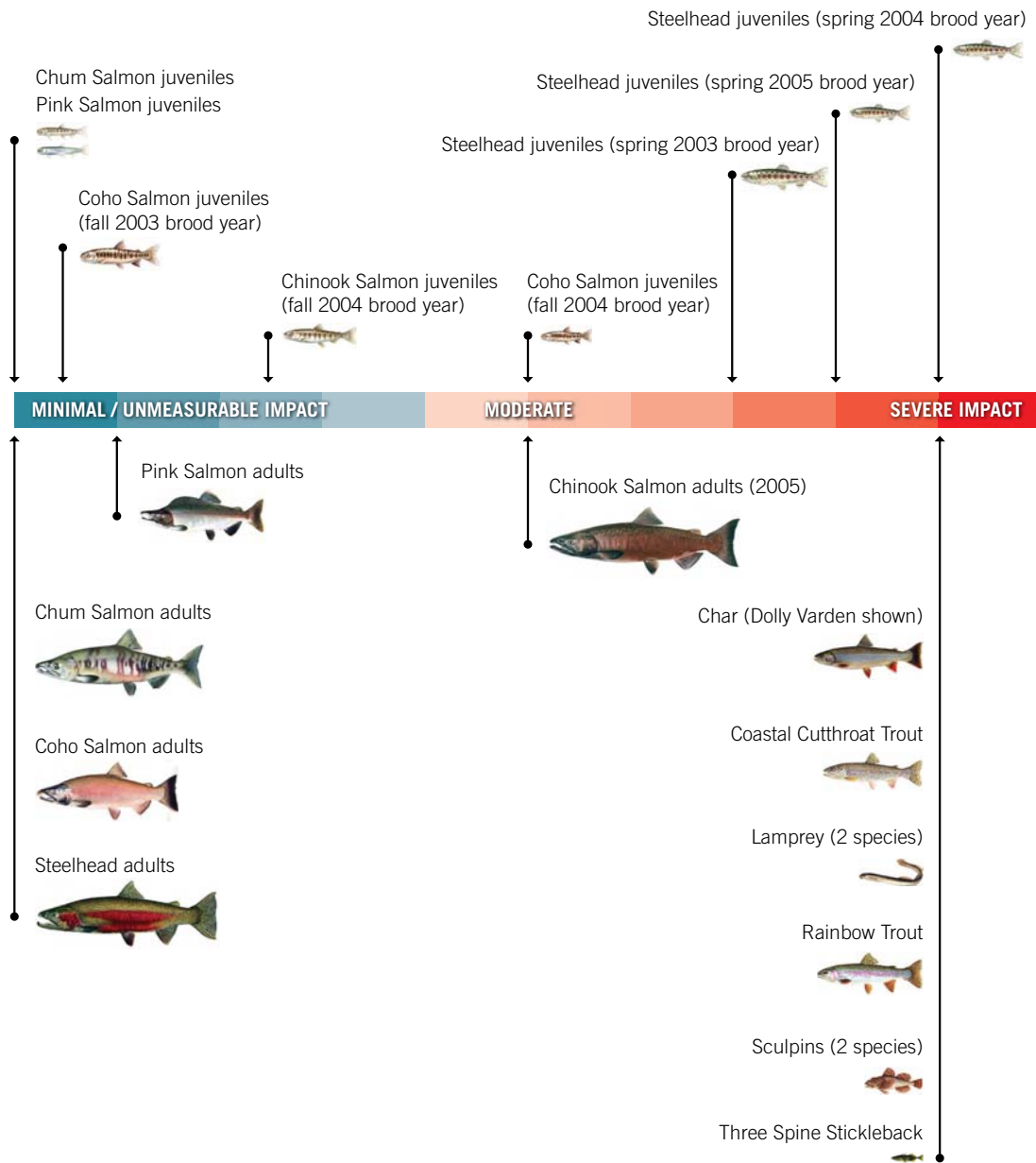
In addition to the projects above CN and CERTC are continually looking for new opportunities for feasible projects to improve habitat conditions and accelerate recovery of the Cheakamus River.



CHEAKAMUS ECOSYSTEM RECOVERY

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Estimated impact on fish in the Cheakamus River



Information summarized and adapted from McCubbing et. al. 2006: Assessment of the CN Caustic Soda Spill, August 5th, 2005 on the Fish Populations of the Cheakamus River, Final draft report March 2006