

## STATE OF THE RIVER

### BACKGROUND

On August 5<sup>th</sup> 2005, a train derailment in the Cheakamus canyon, approximately 15 km north of Squamish, British Columbia, resulted in a sodium hydroxide spill into the Cheakamus River.

After the spill the Cheakamus Ecosystem Restoration Technical Committee (CERTC), which is comprised of representatives from CN, the District of Squamish, Fisheries and Oceans Canada (DFO), BC Ministry of Environment (MoE) and the Squamish Nation, was formed. The CERTC mandate is to develop and implement recovery and monitoring programs to accelerate the return of the Cheakamus River ecosystem to a pre-spill state as quickly as reasonably possible.

Assessment projects have been undertaken by CERTC to understand the impacts of the spill on various ecosystem components and assist with recovery planning. These programs looked at the direct impacts of the spill on fish and invertebrates, as well as the potential for other indirect ecological effects from a reduction in food availability (*e.g.* reduced availability of fish).

The Cheakamus Ecosystem Recovery Plan (CERP) 2006 was completed in August 2006 and is available on the CERTC Website at [www.certc.ca/recovery\\_plan.shtml](http://www.certc.ca/recovery_plan.shtml). The CERP was revised in 2007 as part of a CERTC commitment to conduct an annual review. This document provides a brief summary of CERTC activities including monitoring programs and preliminary results, as well as recovery activities. More information regarding all of these programs is available on the CERTC Website at [www.certc.ca](http://www.certc.ca).

### MONITORING PROGRAMS

Since 2005, CN in cooperation with CERTC has undertaken a variety of programs to identify and implement recovery strategies and monitor recovery. Some of the fish monitoring programs rely on cooperative data sharing with BC Hydro as part of its Water Use Plan (WUP). Table 1 lists the monitoring programs developed to date. Study outlines for monitoring programs and results to date are available online at: [http://www.certc.ca/monitoring\\_programs.shtml](http://www.certc.ca/monitoring_programs.shtml).

**Table 1. Monitoring Programs as of 2007**

Monitoring Program	Species	Dates
Off-Channel Habitat Mark Recapture - CN	Juvenile salmonids	2006
Non-Anadromous Reach Fish Abundance Monitoring Program - CN	Primary: rainbow trout Secondary: char, sculpin, stickleback	2006-TBD
Char Adult Enumeration - CN	Bull trout	2000-2014
Char Adult Radio Telemetry - CN	Bull trout	2007-2009
Resident Fish Abundance Monitoring Program (RAMP) - CN	Sculpin, lamprey, cutthroat trout, char, stickleback, rainbow trout/steelhead juveniles	2006 - 2014

**Table 1 (Cont.). Monitoring Programs as of 2007**

Monitoring Program	Species	Dates
Benthic Invertebrate Recovery - CN	Benthic invertebrates	2005
Steelhead Acoustic Tracking of Hatchery Smolts - CN	Steelhead	2007-2008
Steelhead fish culture– CN/MoE	Steelhead smolts and adults	2007 - 2012
Coded Wire Tagging CN/DFO/PSF	Chinook	2006
Steelhead Adult Enumeration – BC Hydro	Steelhead	2000-2014
Outmigrant Monitoring – BC Hydro	Coho, and steelhead smolts, chinook, pink and chum fry	2000-2014

**MONITORING RESULTS**

The status of some fish species and communities affected by the spill are outlined in Table 2. Monitoring programs are ongoing and only results available to date are presented.

**Table 2. Fish population status - 2006**

Species	Recovery Target	2006 Status
<b>Chinook Salmon</b>	60,000 to 220,000 outmigrants	2005 = 60,851 – non-impact 2006 = no estimate - impact year
<b>Coho Salmon</b>	39,000 to 128,000 outmigrants	2005 = 39,087 – non-impact 2006 = 36,209 impact year
<b>Pink Salmon</b>	10% increase over 2006 estimate (>326,045 fry)	2005 – off year 2006 = 296,405
<b>Cutthroat Trout</b>	Population stability	Ongoing evaluation
<b>Steelhead Trout</b>	255 to 469	2006 = 255 <sup>1</sup> adults – non impact 2007 = non impact, estimate forthcoming
<b>Char (Bull Trout)</b>	Target being developed through radio telemetry and snorkel surveys	2007 population estimate forthcoming
<b>Threespine Stickleback</b>	Population stability	Juveniles observed – recruitment since the spill
<b>Sculpin</b>	Population stability	Sculpins more abundant in lower four kilometers
<b>Lamprey</b>	Population stability	Impacts overestimated – multiple age classes

1 - 2006 adult steelhead returns reported as preliminary data from BC Hydro and subject to change

## RECOVERY PROGRAMS

In addition to monitoring programs, recovery projects make up a major component of the CERP. Numerous recovery programs funded by CN have been developed and are in different stages of implementation in cooperation with CERTC members. These programs are listed in Table 3 below while more detailed information is available online at:

[http://www.certc.ca/recovery\\_programs.shtml](http://www.certc.ca/recovery_programs.shtml).

**Table 3. Summary of recovery programs funded by CN to date**

Recovery Program	Type of project	Date	Status
Fish Culture	Fish stocking	2005-2010	Ongoing
Dave Marshall Salmon Reserve (NVOS)	Habitat enhancement	2006	Complete
Cheekye Bridge Fish Passage Modification	Habitat enhancement	2007	Pending
Km 8 Re-Wetting	Habitat enhancement	2008	In Development
Km 6.5 Channel Re-Wetting	Habitat enhancement	2007	Complete
Wilson Slough Reunion	Habitat enhancement	2007	Pending
LWD Demonstration Project	Habitat enhancement	2007	Complete
Cheakamus Ecosystem Recovery Fund	Enhancement projects	2007-2011	Ongoing

### Fish Culture Program

Fish culture programs funded by CN and implemented by DFO and the Freshwater Fisheries Society of BC (for MoE) are being used for a short period of time to increase fish numbers during the years populations are expected to be low. The total number of fish to be released is close to 3 million (Table 4).

**Table 4. Fish Culture Program releases**

Species	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010 <sup>1</sup>
<b>Chinook</b>	<u>Actual:</u> 7,378 fry Spring 2006	<u>Target:</u> 100,000 eggs <u>Actual:</u> 106,513 eggs Spring 2007	<u>Target:</u> 100,000 eggs <u>Actual:</u> 108,000 eggs Fall 2007		Program ends
<b>Pink</b>	<u>Actual:</u> 574,533 fry Spring 2006	Off Year	<u>Target:</u> 1,000,000 eggs <u>Actual:</u> 442,000 eggs Fall 2007	Off Year	<u>Target:</u> 1,000,000
<b>Coho</b>	Not Planned	Not Planned	<u>Target:</u> 80,000 fry		Program ends
<b>Steelhead</b>	Not Planned	<u>Target:</u> 20,000 smolts <u>Actual:</u> 21,480 Spring 2007	<u>Target:</u> 20,000 smolts <u>Actual:</u> 18,000 fry rearing		Program ends

1 - No fish culture programs proposed post 2009/2010

# CERTC

Cheakamus Ecosystem Restoration Technical Committee

## Cheakamus Ecosystem Recovery Fund

The Cheakamus Ecosystem Recovery Fund (CERF) has been established by CN to complement ongoing recovery efforts and encourage the construction of enhancement projects on the Cheakamus River by local residents and environmental stewardship groups. The yearly budget for all projects will be \$400,000 and the program will run from 2007 until 2011. Additional information, application criteria and application form can be obtained online at:

[http://www.certc.ca/recovery\\_fund.shtml](http://www.certc.ca/recovery_fund.shtml).

Projects which have been funded to date in 2007 through the CERF include:

- Assessment of juvenile survival of hatchery-reared coho salmon during downstream migration and early ocean survival. \$50,000 Grant; Michael Melnychuk.
- Creel survey of the Squamish River watershed recreation fishery. Conditional Approval \$36,650 Grant; Squamish River Watershed Society.
- Squamish River estuary training dyke culvert improvement project. Conditional Approval \$59,550 Grant, Squamish River Watershed Society.

## CERTC Website

The Cheakamus Ecosystem Restoration Technical Committee (CERTC) maintains a website to provide updates on recovery projects and monitoring activities. Information available includes meeting summaries, proposed study outlines, and additional information on recovery projects, as well as impact assessment and monitoring reports as they become available.



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