FRASER VALLEY REGIONAL WATERSHEDS COALITION

Stave River Spawning Habitat Restoration Project (2008/2009) Final Report

Submitted to the BC Hydro Bridge Coastal Fish & Wildlife Restoration Program

BCRP Project # 08.SFN.01

July 30, 2009

Executive Summary

Due to the effects of the Ruskin power station on gravel movement in the Stave River watershed, periodic restoration of the spawning areas downstream is required every 10-20 years. Between 1990-1994, DFO and BC Hydro partook in a significant effort to enhance approximately 120,000 square meters – an effort that dramatically increased the amount of salmon returns in the system. Since this project, the actions of the strong escapements of spawning salmon and periodic large dam spillway releases have slowly washed spawning gravels downstream and have begun eroding sections of the streambank. These factors have diminished the habitat capacity of the lower river spawning grounds, thus necessitating further efforts.

Beginning in 2006, DFO and BC Hydro initiated another phase of enhancement activities on the lower Stave River. In 2007, with financial contributions from BC Hydro Bridge Coastal Restoration Program, the Fraser Valley Regional Watersheds Coalition, DFO, and BC Hydro continued these efforts. In 2008-09, a third and final year of projects was continued.

The focus of the 2008-09 project was on the side channel in front of the Ruskin picnic site, just downstream of the power station. The channel was to be deepened and widened to help prevent stranding of salmonids, both the spillway and the intake were to be redeveloped, and the existing footbridge was to be replaced.

Primary construction occurred during the first two weeks of September, 2008. The entire channel was deepened by about one metre (to elevation 1.00 geodetic) and the channel overflow was rebuilt to invert 1.6 geodetic. The gravel obtained was spread along the banks for erosion protection. New concrete lock block abutments were installed, and a new steel/wooden footbridge was engineered and installed in May, 2009 to replace the old bridge. In addition to the above, four to five truckloads of sand were spread out on the beach to enhance the recreational value of the site, over 300 riparian plants were added to the bank by community volunteers, Kwantlen First Nation project assistants helped to engage and inform visitors to the site about the watershed, and working relationships between project partners was strengthened for potential future projects.

The total project value was estimated at $136,000, with $72,878.69 being contributed by the BC Hydro Bridge Coastal Restoration Program. Additional in-kind contributions were made from DFO, BC Hydro, the Fraser Valley Regional Watersheds Coalition, the Fraser Valley Regional District, and the Stave Valley Salmonid Enhancement Society.

Recommendations for further actions on the site include adding signage that describes the value of the watershed as fish habitat and that acknowledges project contributors, and fertilizing the plantings placed along the banks for increased likelihood of becoming established in the poor soil conditions present.

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1. Introduction

The lower Stave River, between the Ruskin Dam and the Fraser River, consists of numerous channels and gravel bars with predominantly deciduous vegetation growing on the more established bars and river banks. This section of the river supports the second largest chum salmon population in the Fraser River watershed (after the Harrison River). Over 500,000 chum salmon and thousands of coho and Chinook salmon have been recorded spawning within these graveled channels. Because of the presence of the dam, the lower 3 km section of the Stave River provides the only remaining habitat for spawning salmon within this watershed.

The presence of the Ruskin Power Station, located immediately upstream of this section, has a significant ongoing influence on gravel recruitment, sedimentation, and erosion processes in much of the lower Stave River. Fisheries and Oceans Canada (DFO) and BC Hydro initiated works in 2006. In 2007 a major restoration effort was undertaken to re-contour and re-distribute gravel for enhanced spawning habitat, and to prevent further streambank erosion along a substantial portion of the east (left) bank about 500 m downstream of the power station. This project was undertaken as a partnership between BC Hydro, Fisheries and Oceans Canada, Fraser Valley Regional Watersheds Coalition (FVRWC), Fraser Valley Regional District (FVRD), and Kwantlen First Nation.

Thanks to the partnerships that were created during the 2007 project, as well as continued financial support from BC Hydro's Bridge Coastal Fish and Wildlife Restoration Program, a 2008 project was undertaken to further enhance both fish habitat in the lower Stave River and community appreciation for the watershed. This project would work primarily in the side channel located just off the Ruskin Picnic Site, approximately 200m downstream of the power station. It is anticipated that the 2008-9 works will conclude the fish habitat enhancement works for the time being.

This report summarizes the results of this project, conducted in 2008-09, with funding support from the BC Hydro Bridge Coastal Fish and Wildlife Restoration Program (BCRP) and in-kind support from DFO, BC Hydro, the FVRD, and the Fraser Valley Regional Watersheds Coalition.

2. Goals & Objectives

The three primary objectives of the 2008 works on the lower Stave River were to:

1. Rehabilitate 30,000 square metres of in-stream salmon spawning habitat,
2. Reduce bank erosion along the Stave River,
3. Replace pedestrian bridge with a stronger structure to accommodate current high volume of pedestrian traffic.

Secondary objectives included:

4. Develop strong working relationships between project partners, and
5. Increase awareness amongst the community about the value of the watershed.

3. Study Area

The project area was along the lower Stave River, between the Ruskin Dam and the confluence with the Fraser River, within the District of Mission (Figure 1). This year's project occurred approximately 200 metres downstream of the power station, off of the BC Hydro Ruskin Picnic Site on the east (left) bank.

Figure 1. Project study area

4. Methods

Following a similar methodology that was successfully used during the 2007 project, project partners were allocated specific roles and responsibilities:

- **Grant application and funding**: Fraser Valley Regional Watersheds Coalition
- **Project Management:** Fraser Valley Regional Watersheds Coalition
- **Project Design:** Fisheries and Oceans Canada biologists and engineers
- **Site Management and Construction Supervision:** DFO engineering
- **Site Assistance, Public Securing and Awareness:** Fraser Valley Regional Watersheds Coalition & Kwantlen First Nation

- **Project Reporting:** Fraser Valley Regional Watersheds Coalition
- **Ruskin Power Station Support and Cooperation:** BC Hydro

Unlike the 2007 project however, which involved crossing the main channel and hence deeper water, the 2008 project primarily occurred in a side channel and largely upstream of tidal influences from the Fraser River. A variance in tailwater elevations from BC Hydro was therefore not required for this year's project; however, a request was made to BC Hydro to maintain minimum flows for the construction period. This request was granted pending major precipitation events upstream.

Two members of the Kwantlen First Nation were employed for two weeks during project construction. They provided assistance to the site supervisor (DFO), helped with public safety, and engaged members of the public who visited the site about the watershed and the value of the river and the project.

Although at one point it was taken off the scope of the project, funding to replace the footbridge was provided by BC Hydro Bridge Coastal Restoration Program following site inspections of the bridge by BC Hydro staff. The old bridge was showing signs of wood-rot, and reportedly had its bridge deck inundated by water on several occasions during particularly high water flows on the system. The new wooden/metal bridge was engineer-designed and constructed, was installed on to new lock blocks, and, as is my understanding, will now be maintained by BC Hydro.

5. Results

Site meetings occurred on June 26 and July 24, 2008 (Figure 2). These meetings allowed the opportunity to clarify the project objectives and design, discuss tasks, and determine appropriate timelines.

Figure 2. Pre-planning site visit of project partners (FVRWC, DFO, BC Hydro) and inspection of quality of footbridge.

The contractor utilized a 68,000 to 88,000 pound hydraulic excavator, two articulated off-highway dump trucks (Cad D25D), and a bulldozer. Work was done from September 2nd to September 12th, 2008. Due to initial confusions and uncertainty about whether or not replacing this bridge is included in the scope of this project, the decision to include bridge replacement came too late to occur in the fall. As a result, the installation of the new bridge was to be delayed until spring water levels dropped to workable levels; as a result, the new footbridge was not installed until May 20-22, 2009.

The project was divided into 5 key components (Figure 3):

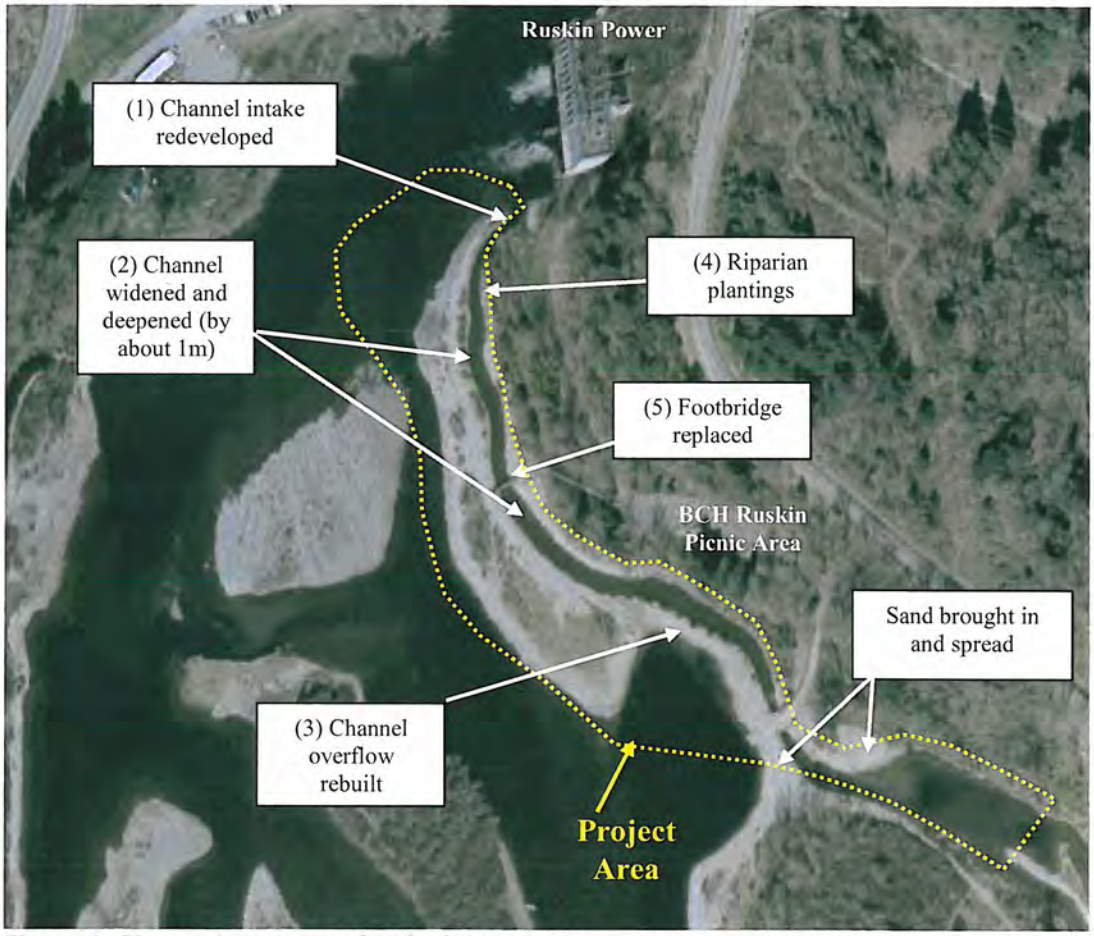


Figure 3. Key project sites and tasks for 2008-9 Lower Stave River project.

1. ***Redevelop the channel intake*** (Figure 4). The rock entrance to the channel was redesigned to improve flows into the channel.

Figure 4. Channel intake redeveloped. Before (left) versus after (right).

2. ***Channel widened and deepened*** (Figure 5). The entire channel was re-graded to elevation 1.00 geodetic to help prevent stranding of salmonids. The excavated gravel was used to stabilize the channel banks against further erosion.

Figure 5. Channel excavation and bank stabilization.

3. ***Channel overflow rebuilt*** (Figure 6). A spillover near the boat ramp connecting the channel to the rest of the Lower Stave was rebuilt to invert 1.6 geodetic at station 2+50.

Figure 6. Channel overflow redeveloped. Before (left) versus after (right).

4. ***Riparian plantings*** (Figure 7). Along the bank stabilized with gravel, native riparian plants were added by the Stave Valley Salmonid Enhancement Society using community volunteers to provide further stability as well as enhanced riparian habitat. Plants were added along the left channel bank southeast of the footbridge. In total, 310 plants were added to approximately 150m^2, including: 60 red alder, 50 black cottonwood, 80 Nootka rose, and 120 hardhack plants. Plants were placed according to elevation above river level with hardhack at the lowest elevation followed by cottonwood, rose and alder above. This matches the natural growth of near by gravel banks. Planting was done in the fall to allow for sufficient root growth for summer survival as soil conditions on the site were quite poor.

Figure 7. Riparian plantings along stabilized bank. Over 300 plants were added to the site.

5. ***Footbridge replaced*** (Figure 8). The old wooden footbridge was lifted off its foundation and placed to the side during construction. A couple of the old lock block abutments were re-used; others were purchased and placed. The old bridge was temporarily placed back onto the new foundation at the conclusion of the in-stream works (Sept 12th) until the new bridge could be designed and installed. The new wooden/steel footbridge was prepared and installed May 20-22, 2009 using a Komatsu PC300-7LC excavator under the supervision of a DFO engineer.

Figure 8. Replacement of pedestrian footbridge.

In addition to these, other project components included:

- Two Kwantlen First Nation members were hired for the duration of the construction activities. They served a dual role: (1) site safety - they kept people behind the safety fences erected for the project and warned people about the machinery in operation at the time; (2) outreach - they handed out brochures prepared by the Coalition (Appendix III) that described the project, the watershed values, and the key partners involved. It was estimated that over 120 copies of this brochure were handed out to visitors during the construction period.

- Distributing and spreading 4-5 truck loads of sand delivered by BC Hydro for enhanced recreational value of the site in the vicinity of the boat ramp (see Figure 3).

- The Coalition profiled the project at various public meetings with full acknowledgement provided to BCRP for their contributions towards this project.

The amount of spawning area that was redeveloped as a result of this project is approximately 4,000 square metres (M. Landiak, personal communication). Using the standard formula of 250 chum fry/m^2 (M. Foy, personal communication), this equates to habitat improvements for 1,000,000 chum fry per year as a result of this project. The combined efforts on the river over the past three years (starting in 2006) are estimated to have resulted in 30,000 m^2 of total in-stream habitat improvements.

The total value of the project was estimated at $136,178.69, of which, $72,878.69 was provided by BC Hydro Bridge Coastal Restoration Program (Appendix I). $63,300.00 was provided by in-kind contributions by DFO, the FVRD, and the Coalition. The project came in slightly under-budget (original budget was estimated at $180,600), largely due to project costs being lower than expected (e.g., machine rental costs that were estimated to cost $74,000 only ended up costing $33,495).

6. Discussion and Recommendations

The project was completed under budget and was successful at achieving each of its project objectives (Table 2). This year's project was intended as the third and final year of a three-year effort to enhance fish habitat within the Lower Stave River. The combined efforts on this work should ensure productive habitat exists within the watershed for the next 10-20 years.

Table 1. Project evaluation

Objective	Evaluation
(1) Rehabilitate 30,000 square meters of salmon spawning habitat	An estimated 4,000m2 of salmon habitat was enhanced along the far left side of the Lower Stave River just downstream of the power station. In conjunction with efforts over the past 2 years that has enhanced habitat throughout the Lower Stave River, an estimated 30,000m2 of salmon spawning habitat has been rehabilitated within the system. ***Conclusion: Successful***

(2) Reduce bank erosion along Stave River	Gravel from the streambed was pushed towards the banks of the channel, protecting the shoreline from further erosion. Approximately 150 m2 of these banks was then replanted with native shrubs to provide further long-term stability as well as riparian habitat. *Conclusion: Successful*
(3) Replace pedestrian bridge with a stronger structure to accommodate current volume of pedestrian traffic.	The old wooden bridge was determined to be in need of replacement due to age and the high volume of pedestrian traffic using it. A new engineered bridge was designed, built, and installed using new lock block abutments. *Conclusion: Successful*
(4) Develop strong working relationships between project partners	Communication between project partners throughout planning and construction phases helped contribute to the project success and completion. The project is a prime example of the value of partnerships, with strong support coming from multiple agencies and organizations to help achieve project results. *Conclusion: Successful*
(5) Increase awareness amongst the community about the value of the Stave River system	In addition to temporary project signage placed in multiple locations during project construction, project assistants engaged and approached visitors to the site to talk about the project, the reason behind it, and the watershed. During the 2 week construction period, they talked to an estimated 120 visitors, and handed out brochures to each. The project was also highlighted in FVRWC correspondence and public meetings. *Conclusion: Successful*

Although not originally intended as an explicit objective, a significant outcome from this project was enhanced recreational value at the site. The new bridge provides abundant aesthetic appeal, in addition to its increased functionality. Plus, as a result of making the channel deeper and less susceptible to dewatering, it has become an enjoyable swimming spot for locals and visitors. These secondary benefits provide an opportunity: if visitors to the site enjoy their experience and the setting, and have an understanding about the area's ecological values and sensitivities, they are more receptive to being stewards of the watershed.

In order to foster this stewardship ethic, follow-up efforts could include interpretive signage being placed at the site informing people about the fish that frequent the site and the important fish habitat the site contains. In particular, the new pedestrian bridge is an ideal location to both acknowledge project contributors as well as inform and engage the public.

A second recommendation for the site is to provide periodic fertilization to the newly planted shrubs along the banks. The soil conditions were poor in these areas, with low nutrient availability. Providing some fertilizer, at least for the first couple of years until the plants are established, would increase their chance of providing long-term riparian habitat.

7. Conclusions

The spawning habitat within the lower Stave River supports the second greatest chum salmon population in the Fraser Basin, estimated at over 500,000 spawners per year. As a

result of the redd-digging activities of all these salmon, combined with the substantial hydrological influence of the Ruskin Dam immediately upstream, this spawning habitat requires periodic rehabilitation every 10-20 years to retain its high habitat quality. The first major restoration project was conducted from 1990-1994. The next project was scheduled for 2006-2009. This report summarizes the results of activities conducted from 2008-09, with funding support from the BC Hydro Bridge Coastal Fish and Wildlife Restoration Program.

The 2008/09 project represented a collaborative effort involving the Fraser Valley Regional Watersheds Coalition, Fisheries and Oceans Canada, the Fraser Valley Regional District, BC Hydro, the Kwantlen First Nation, BC Hydro, and the Stave Valley Salmonid Enhancement Society. Project objectives included:

1. Rehabilitate ~30,000 square meters of in-stream salmon spawning habitat.
2. Reduce bank erosion on Stave River.
3. Replace pedestrian bridge with a stronger structure to accommodate current high volume of pedestrian traffic.

Each of these objectives was met as a result of this project, as well as some secondary objectives including increased working relationships between project partners, improved engagement and awareness by the community and visitors about the watershed, and enhanced recreational values at the site. Results are discussed.

8. Acknowledgements

Financial contributions for this project were received from:

- BC Hydro Bridge Coastal Fish and Wildlife Restoration Program

Financial and in-kind support for this project was gratefully received from:

- Fisheries and Oceans Canada
- Fraser Valley Regional District
- BC Hydro
- Fraser Valley Regional Watersheds Coalition
- Stave Valley Salmonid Enhancement Society

Appendix I: Financial Statement of Project Expenditures

Project Number: 08.SFN.01

Financial Statement Form

	BUDGET		ACTUAL	
	BCRP	**Other**	**BCRP**	**Other**
INCOME				
Total Income by Source				
Bridge Coastal Program	$95,000.00	-	$72,878.69	
Fisheries & Oceans (DFO)	-	$64,500.00	-	$41,000 (in-kind)
Fr. Valley Reg. Dist. (FVRD)	-	$12,650.00	-	$12,650 (in-kind)
Kwantlen First Nation	-	$2,000.00	-	-
BC Hydro (BCH)	-	$4,600.00	-	$6,600 (in-kind)
Fraser Valley Regional Watersheds Coalition (FVRWC) & Stave Valley Salm. Enh. Society (SVSES)	-	$1,850.00	-	$3,050 (in-kind)
Sub-Total Income:	***$95,000.00***	***$85,600.00***	***$72,878.69***	***$63,300.00***
Grand Total Income		**$180,600.00**		**$136,178.69**
EXPENSES				
Project Labour				
Project Manager (FVRWC)	$8,800.00	-	$8,800.00	-
Senior Biologist Design and Construction (DFO)	-	$12,000.00	-	$12,000 (DFO, in-kind)
Senior Engineer Design and Direction (DFO)	-	$7,000.00	-	$7,000 (DFO, in-kind)
Aborig. Heritage Consultant	-	$2,000.00	-	-
Engineering Support (DFO)	-	$8,000.00	-	$8,000 (DFO, in-kind)
Construction/Site Supervision (DFO)	-	$12,000.00	-	$12,000 (DFO, in-kind)
Project Labour/Assistant (Kwantlen/DFO)	$5,000.00	$1,000.00	$5,045.70	$1,000 (DFO students, in-kind)
BC Hydro Staff (Biologist, Operator, Rec Site Manager)	-	$4,600.00	-	$4,600 (BCH, in-kind
FVRWC & SVSES	-	$1,600.00	-	$1,600 (SVSES FVRWC, in-kind)
Total Project Labour:	*$13,800.00*	*$48,200.00*	*$13,845.70*	*$46,200.00*
Materials & Equipment				
Machinery Rental/Operation	$54,000.00	$20,000.00	$33,493.57	-
Misc Equip Rental (fencing)	$2,500.00	$2,500.00	$571.88	-

Metal Bridge replacement	$20,000.00		$19,867.54	-
Plants and equipment	$1,500.00	$1,250.00	$3,100.00	$250 (SVSES, in-kind)
Accommodation		$1,000.00		-
Travel (gas, vehicle lease/maint.)	$900.00	$4,550.00	$900.00	$4,550 (FVRD, in-kind); $1,000 (DFO, in-kind
Signage	$2,000.00		$800.00	$1,200 (FVRWC, in-kind)
Gravel				$2,000 (BCH, in-kind)
Total Materials & Equip	*$80,900.00*	*$29,300.00*	*$58,732.99*	*$9,000.00*
Administration				
Office space/computers		$4,800.00		$4,800.00 (FVRD, in-kind)
Telephone	$300.00	$300.00	$300.00	$300.00 (FVRD, in-kind)
Office Supplies (printer, etc.)		$300.00		$300.00 (FVRD, in-kind)
Printing/Photocopying		$200.00		$200.00 (FVRD, in-kind)
Courier/Postage		100.00		100.00 (FVRD, in-kind)
Software		$500.00		$500.00 (FVRD, in-kind)
Camera		$400.00		$400.00 (FVRD, in-kind)
Insurance		$500.00		$500.00 (FVRD, in-kind)
Employee payroll and benefit administration		$1,000.00		$1,000.00 (FVRD, in-kind)
Total Admin Costs	*$300.00*	*$8,100.00*	*$300.00*	*$8,100.00*
Sub-Total Expenses:	***$95,000.00***	***$85,600.00***	***$72,878.69***	***$63,300.00***
Grand Total Expenses (BCRP + other)		**$180,600**		**$136,178.69**
BALANCE (Grand Total Income – Grand Total Expenses)		**0**		**0**[a]

[a] Note: Regarding the actual expensed budget, income and expenses are balanced; however, the project did come in under budget, particularly with regards to machine time requirements. As a result, only $72,878.69 of the potential $95,000 made available by BCRP for this project was required (leaving a project surplus of $22,121.31).

Appendix II: Performance Measures

Project Number: 08.SFN.01

Performance Measures – Target Outcomes													
Project Type	**Primary habitat benefit targeted of project**	**Primary Target Species**	**Habitat (m2)**										
			Estuarine	In-stream Habitat – Mainstream	In-stream Habitat – Tributary	Riparian	Reservoir Shoreline Complexes	Riverine	Lowland Deciduous	Lowland Coniferous	Upland	Wetland
Impact Mitigation													
Fish passage technologies	Area of habitat made available to target species												
Drawdown zone revegetation/stabilization	Area turned into productive habitat												
Wildlife migration improvement	Area of habitat made available to target species												
Prevention of drowning of nests, nestlings	Area of wetland habitat created outside expected flood level (1:10 year)												
Habitat Conservation													
Habitat conserved – general	Functional habitat conserved/replaced through acquisition and management												
	Functional habitat conserved by other measures (e.g. riprapping)												
Designated rare/special habitat (subset)	Rare/special habitat protected												
Maintain or Restore Habitat forming process													
Artificial gravel recruitment	Area of stream habitat improved by gravel placement	Chum salmon		30,000*		150							
Artificial wood debris recruitment	Area of stream habitat improved by LWD placement												
Small-scale complexing in existing habitats	Area increase in functional habitat through complexing												
Prescribed burns or other upland habitat enhancement	Functional area of habitat improved												
Habitat Development													
New habitat created	Functional area created												

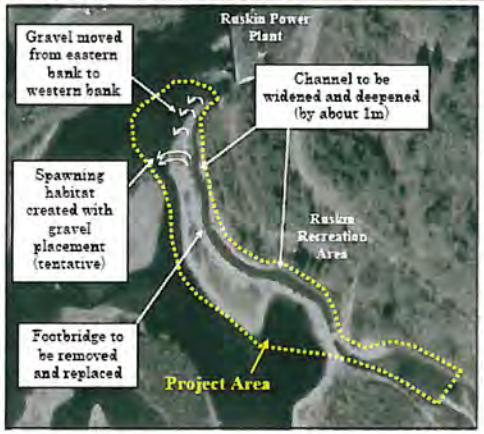
* This year's project was estimated to have resulted in an area of approximately 4,000 m2 of spawning area restored or enhanced. The 30,000 m2 is the cumulative estimate from the past three years of efforts (2006-2009).

Appendix III: Confirmation of BCRP Recognition (specific mentions of BCRP highlighted with red arrow)

A: Project Brochures: (handed out to visitors during construction)

(first page)

Project Overview



The lower 3 km section of the Stave River provides the only remaining habitat for spawning salmon within the Stave River watershed. Due to the effects of Ruskin power station on gravel movement in the watershed, periodic restoration of the spawning areas downstream is required. Restoration work is currently underway to rehabilitate the spawning grounds to their full capacity.

Thanks to restoration efforts undertaken since 1998 by DFO, BC Hydro, the Coalition and others, over 500,000 chum salmon, along with seven other salmonid species have been recorded spawning in the lower Stave River. The Stave River is now the second largest chum salmon population in the Fraser River watershed (second only to the Harrison River).

This year's project, funded by BC Hydro Bridge Coastal Restoration Program, is being conducted along the east bank of the lower Stave River in front of the Ruskin Recreation Site. The near channel is being deepened; gravel (from the channel) will be placed on adjacent gravel bars for further spawning habitat; and, the wooden footbridge will be removed and replaced with a more permanent structure.

Looking towards the Ruskin Power Station—the channel on the right is being deepened and gravel is being shifted to the left of the bar.

Looking onto the footbridge near the far parking lot at the Ruskin Recreation Site. The channel under the bridge will be deepened and re-graded for enhanced fish habitat. The footbridge will be temporarily removed and will be replaced following project completion.

Downstream of the footbridge—channel to be excavated to enhance habitat value for salmon spawning and survival, particularly during low flow conditions within the river.

Alternative recreation sites to consider while work is occurring

Although the picnic area at the Ruskin Recreation Site will remain open, the water and streambank at the site will be off limits for the duration of the project (Sept 3-12, 2008) because of the heavy machinery that will be running along the channel. Alternative recreation sites to please consider while the project is underway include:

1. **Hayward Lake Recreation Area** (beach and picnic areas, trails, fishing, non-motorized boat launch)
2. **Stave Lake** (boat launch, fishing, beach and picnic area)
3. **Rolley Lake Provincial Park** (swimming, camping, canoeing, hiking, fishing)
4. **Devil's Lake** (swimming, hiking)
5. **Whonnock Lake** (beach and picnic area, paddling, hiking, swimming)

- we apologize for any inconvenience -

☺

(second page)

What is the Fraser Valley Regional Watersheds Coalition?

The Fraser Valley Regional Watersheds Coalition (FVRWC) is a community-based "group of groups" that spans multiple municipalities, levels of government, as well as community groups and citizens. The FVRWC was first established to encourage communities to play a greater role in watershed restoration and enhancement, habitat protection, and salmonid stock assessment. Over time, our activities have broadened to include watershed planning (e.g., Chilliwack River Watershed Strategy), stewardship and awareness initiatives, training, mapping and inventory projects, and a watershed speaker series.

Mission Statement: Promoting the understanding and action of communities in the Fraser Valley region to achieve healthy watersheds and the communities that they support

Geographic 'Area of Interest': Includes the watersheds of central/upper Fraser Valley and the lower Fraser Canyon.

Coalition Fast Facts

- Became a Fisheries Renewal Partnership Group in 1997
- Completed approximately 70 projects throughout the Fraser Valley
- Received Fraser Basin Council's Caring for Ecosystems Award – November 2000
- Received approximately $4 million from grants, funds, and in-kind contributions for watershed improvement projects since inception
- Over 200 individuals from more than 80 groups and agencies have been involved with the Coalition.

The Coalition has an open-door, inclusive policy. All individuals, groups, and organizations interested in watershed sustainability issues are invited to participate.

For more information, please contact:

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Fraser Valley Regional Watersheds Coalition
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www.fvrwc.org

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Stave River Salmon Habitat Enhancement Project (2008)

- Dates: **Sept 3—12, 2008** (may vary depending on weather conditions)
- Times: 8am—5pm (approx)
- Site: Lower Stave River along the banks of the channel off the Ruskin Recreation Site
- Project Partners:
  - Fraser Valley Regional Watersheds Coalition
  - Fisheries and Oceans Canada
  - BC Hydro Bridge Coastal Restoration Program
  - Fraser Valley Regional District
  - BC Hydro
- Purpose: To restore & enhance salmon habitat within the lower Stave River

B: Project Signage:

At each public access point (by boat ramp and by pedestrian bridge at back of parking lot), temporary signs (shown below) were provided on fencing during project construction to inform about the project and to warn of machinery.

Fish Habitat Enhancement Work in Progress

- DO NOT ENTER -

HEAVY MACHINERY IN USE!

In-stream construction to improve fish habitat in the Lower Stave River is scheduled to occur from September 3-5; 8-12, 2008 (8am – 5pm, weather permitting). Heavy machinery will be in operation along the near channel in front of the Ruskin Recreation Site, so please remain safe and avoid the site when work in progress. Information inquiries can be directed to the Fraser Valley Regional Watersheds Coalition @ 604-702-5006. We apologize for any inconvenience.

Project partners include:
- BC Hydro Fish & Wildlife Bridge Coastal Restoration Program
- Fraser Valley Regional Watersheds Coalition
- Department of Fisheries and Oceans Canada
- Fraser Valley Regional District
- Kwantlen First Nation
- BC Hydro

Nearby recreation areas to consider while work is in progress at this site:

1. Hayward Lake Recreation Area (beach and picnic area, trails, fishing, boat launch for non-motorized boats)
2. Stave Lake (boat launch, fishing, beach and picnic area)
3. Rolley Lake Provincial Park (swimming, camping, hiking, fishing, canoeing)
4. Devil's Lake (swimming, hiking)
5. Whonnock Lake (beach and picnic area, paddling, hiking, swimming)