Fraser Salmon & Watersheds Program

2008 Final Report Template

FSWP File Number*	*07350-35/FSWP 08HPRD106*

*Please use the FSWP File Number provided in previous FSWP 2008 project correspondence

Contact Information

Sponsoring Organization's Legal Name						
British Columbia Conservation Foundation						
Are you a federally registered Charity, Non-profit organization or Business (Yes /No)?						**Yes**
If yes, please indicate which.	**Yes**	**Charity**	**Yes**	**Non-profit organization**		**Business**
Registration number	123042822RR0001			**GST number**	12304 2822 RT0001	
Are you a registered Society (Yes / No)?	**Yes**			**Society Registration number**	S-8351	

Mailing Address
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[1] *All correspondence will be directed to the Project Manager.*

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Partners / Subcontractors	
Name:	Affiliation:
Phone: ( )	E-mail:
Name:	Affiliation:
Phone: ( )	E-mail:

Name: r	Affiliation:
Phone: ( )	E-mail:

Project Information

Project Title

Silverhope Creek Mainstem Restoration

Project Location

Silverhope Creek - Approximately 16km south of the town of Hope, BC.

Amount Requested	$22,000	Total Project Value	$81,210	Non-FSWP funds[2]	$59,210

[2] *Non-FSWP funds include both cash and in-kind funding. In-kind funding refers to all non-cash contributions such as equipment, supplies, labour, etc. Please refer to Budget Section for further details.*

Project Summary

Please provide a single paragraph describing your project, its objective, and the results. As this summary will be used in program communications, clearly state the issue addressed and avoid overly technical descriptions. Do not use more than 300 words.

The goals of this project were to: a) accelerate the natural recovery of riparian vegetation by creating habitat structures that play a key role in bank stabilization; b) re-establish high quality juvenile salmonid mainstem habitat; and c) increase stream habitat characteristics and productivity to provide greater smolt-yields.

Historical road development and logging activities in the Silverhope watershed have resulted in significant impacts on aquatic habitat over past decades. The Silver-Skagit Forest Service Road runs parallel to Silverhope Creek from Hope to Ross Lake State Park (United States).

The reduction of natural stream structure development in the form of natural log jam accumulation, and associated river meander patterns have prevented pools, riffles, and runs, which are highly utilized by juveniles, from being developed. This freshwater habitat degradation is believed to be a contributor to the declines in steelhead and char populations within this watershed.

The mainstem placement of anchored woody debris fish habitat structures will benefit the ecosystem by providing localized stream depth from associated scoured pool development, hydrological protection during floods, and enhanced gravel storage amongst the structure. The collection of organic matter will also provide a host for invertebrate community growth, improving food/energy resources for juveniles to sustain the harsh fall/winter/spring river environment.

The focus of the 2008 stream rehabilitation work has been a one kilometre reach, located between road kilometre marker 14.5 and 15.5. The rehabilitation ties into two kilometres of previous restoration work, which was completed over the past three years immediately downstream. A total of 10 large woody debris habitat structures were proposed in the 2008 restoration plan, though a total of 13 woody debris restoration units were actually implemented. This included: 11-triangulated habitat structures; 1-single log habitat unit; and 1-parallell habitat structure. A total of 36 coniferous trees/logs were used, and were on average 15m in length, and 0.5m diameter at the butt end (not including the width of the rootwad).

OPTIONAL **If your project lends itself to sparking interest through a compelling sound bite (for potential use in FSWP media communications), please tell us what that sound bite would be. Do not use more than 150 words.**

"The destruction of trees bordering on streams and the changed conditions of the banks produced thereby has resulted in the destruction of the natural harbours or hiding places of the trout; this is the main cause of depletion, and unless these harbours are restored, it will be useless to hope for any practical benefit of restocking them".
Van Cleef 1885

(from an investigation of the Catskill trout streams, New York) (Courtesy of Pat A. Slaney)

Species and life stage(s) the project targets: please list

Steelhead (*Oncorhynchus mykiss*) – multi-faceted benefits will provide habitat improvements for all life stages while in the freshwater environment including adult, egg, and juvenile rearing.

Resident Rainbow Trout (*Oncorhynchus mykiss*) – multi-faceted benefits will provide habitat improvements for all life stages

Bulltrout (*Salvelinus confluentus*) – multi-faceted benefits will provide habitat improvements for all life stages while in the freshwater environment including adult, egg, and juvenile rearing.

Watershed(s) the project targets: please list

Silverhope Watershed - 100-158000-23600-78800-5964

Project Deliverables and Results

- **Paste in the deliverables outlined in your Detailed Proposal (question #3 under project 'relevance and significance' heading) into the table below. Then, please list the results associated with each deliverable.**
- **Please include copies of any relevant communications products (brochures, posters, videos, website addresses etc.) resulting from this project.**

Deliverable	Result
Consultation, Permitting and Approvals	Appropriate permit packages were submitted to: Ministry of Environment; Department of Fisheries and Oceans; and Coast Guard - Navigable Waters Protection.
Material & Equipment Sourcing and Staging	To prevent theft and vandalism of project materials and supplies, project material staging took place at the same time as "instream restorative activities". Project material sourcing occurred months prior to project implementation.
Instream Restorative Activities	Instream construction of large woody debris habitat structures began in the middle of July, using the spyder excavator. A total of 13 large woody debris habitat units were created (three more than originally proposed).
Post-Construction Wrap-Up	General project activities included: site remediation with the spyder, posting of warning signs, cabling/securing of all woody debris structures, tamper-proofing structure hardware, and post-construction/cabling site inspection.
Project Completion Report	Provided in your hands.

Project Effectiveness

Please evaluate the effectiveness of the project, using the objective standards, quantifiable criteria and/or quality control measures identified in your Detailed Proposal (under question #1 in the 'performance expectations' heading).

Appropriate standards and guidelines were followed during either project design or implementation and included: Standards and Best Practices for Instream Works; A User Guide to Working in and Around Water; Large Woody Debris Structure Ballasting Requirements; and Watershed Restoration Program - Fish habitat rehabilitation procedures.

Standards and Best Practices for Instream Works. 2004. Ministry of Water, Land and Air Protection Ecosystem Standards and Planning Biodiversity Branch.

A User Guide to Working in and Around Water: Regulation under British Columbia's Water Act. 1998. Prepared by BC

Environment Water Management Branch.

D' Aoust. S.G., and R.G. Millar., 1999. Large Woody Debris Fish Habitat Structure Performance and Ballasting Requirements. Watershed Restoration Management Report No. 8

Slaney, P.A. and D. Zaldokas. 1997. Fish habitat rehabilitation procedures. Province of BC Watershed restoration Technical Circular 9: 360p

Through an ongoing BC Conservation Foundation project; "Effectiveness Monitoring of Habitat Restoration" (also co-funded by the FSWP), biophysical data is being collected to provide insight into the degree of use of these wood habitat structures by salmonids. Fish production is quantitatively measured using several methods (snorkel counts of treated/untreated reaches and/or site surveys), using the recently completed *Effectiveness Monitoring Guide for Stream Restoration Conducted for Greater Georgia Basin Steelhead Recovery*.

Results from an August 2008 effectiveness monitoring evaluation of past restoration work on the Silverhope Creek indicated a 5 to 1 preference by steelhead juveniles towards treated woody debris structures to that of control sites, which were characterized by suitable water depth but void of natural wood complexity. The same structures were evaluated in February 2009 and the results concluded a 3.7 to 1 preference towards treated woody debris habitat structures versus control sites.

The durability and performance of the restoration project will be evaluated using Watershed Restoration Program –Forest Investment Plan protocol for *Routine Effectiveness Evaluation*, for a period of three consecutive years post-construction.

Anonymous, 2003. Guidelines for instream and off-channel routine effectiveness evaluation. Province of BC Ministry of Forests Forest Investment Account (FIA), Victoria, BC: 34 p.

Slaney, P.A. 2006. An Effectiveness Monitoring Guide for Stream Restoration Conducted for Greater Georgia Basin Steelhead Recovery. Draft.

What are the top three lessons learned from this project that would be important to communicate to others doing similar work throughout the Basin?

1) Coordinate project material sourcing well in advance, and ensure back-up suppliers are available in case of unexpected circumstances, or shortfalls in product by the original suppliers. This is critical when working within time sensitive work periods, such as "instream work windows".

2) Create an uninterrupted line of communication with your working contractors to be informed on their expected time of arrival with project materials. This will give the project manager the greatest flexibility in implementation of the project, reducing heavy machine downtime.

3) Be well familiar with your project design specifications, site layout, and abilities and limitations, to avoid any extended heavy machine downtime.

Project Effectiveness

Please describe how your project has addressed each Priority Activity identified in your Detailed Proposal.

Priority Activity[1]	How the Priority Activity has been Addressed
Habitat and Water and Stewardship	The Silverhope Creek is one of only two natural, Fraser Valley summer steelhead river systems. This species and watershed rarity deserves the added protection and attention by fisheries and conservation specialists. Maintaining and protecting this species diversity may be critical at maintaining both the Silverhope Creek and Coquihalla River summer steelhead populations. Initiatives through this project have included the protection of mature streamside coniferous trees in a

	vulnerable reach of the Silverhope Creek while providing exceptional instream fish habitat features. Stream bank protection using woody debris will prevent and reduce further erosion of bank sediments, and loss of rare stream side trees and vegetation. Instream habitat complexity will generate diversity in habitat to accommodate all life stages of residing fish, provide cover, a food resource hotspot, protection from flood hydraulics, and stable streambed and water depths associated with the woody debris structures. During the river assessment portion of this project (pre-construction), substantial riparian tree vandalism and tree felling at a roadside, non-registered campsite was observed. This appears to have been the works of irresponsible campers who would cut live trees for fire wood and to occupying their time! We believe that the instream rehabilitation work that was carried out this summer was necessary, in part, to the loss of stream side trees through these actions. With permission from the Ministry of Environment, we closed-off this site to vehicle traffic (maintaining walk-in access) which may reduce the severity of future destruction. At present, there is concern of the mainstem river shifting course across this vegetation depleted site, which is evident by an overflow channel that has already eroded through the forest floor. The closure of this campsite is to provide a period, where the site can naturally regenerate and recruit, with minimal ongoing anthropogenic disturbance.

[1]Please paste each priority activity identified in your Detailed Proposal in the space provided.

Further Comments

Please provide any further comments including recommendations for future conservation efforts and suggestions for helping partners to meet the goals of the Fraser Salmon and Watersheds Program. If your project produced a narrative or scientific report or additional project products (e.g. maps, photos), attach them as an appendix.

8) Appendix (Attach reports, maps, photos, etc if applicable)

Pre-construction, eroding stream bank.

Off-loading rock; used as bank protection, or as ballast material to hold the wood structures in place.

Pre-construction eroding stream bank. Note the size of a tree stump which once protected the bank.

Staging material adjacent to the sites where installation of the wood structures is to take place.

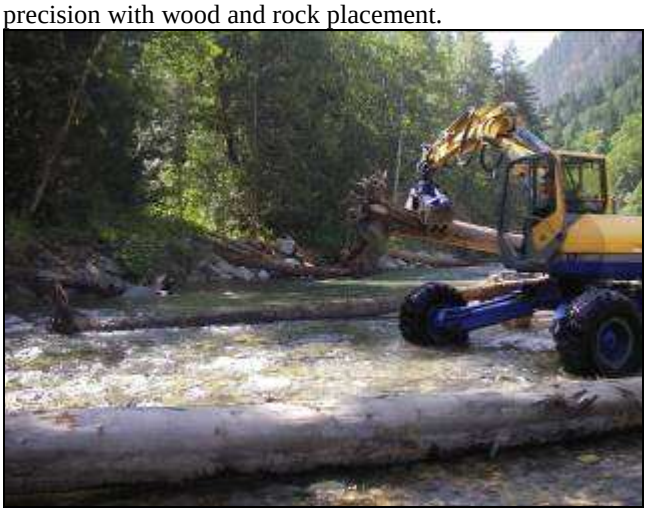
View of the downstream end of the over-flow channel where it re-enters the mainstem.

Heavy machinery working in tandem.

Construction of the wood habitat structures using the environmentally sensitive spyder excavator.

This “clam shell” style grapple/bucket has a swivelling head, allowing for greater manoeuvrability and precision with wood and rock placement.

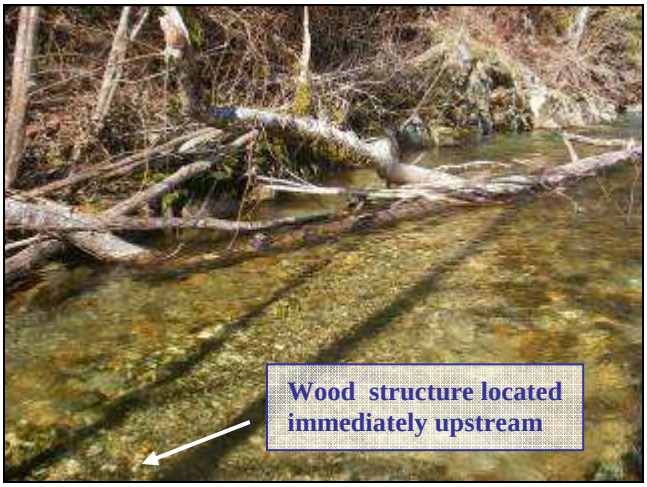
Balloon tires reduce compression of the stream bed.



Biodegradable vegetable based lubricants are used in place of harmful petroleum based products.

Capable of working in extremely deep waters.

Flat pads on the front appendage prevents compression of the stream bed.



Gravel deposition behind one of the wood structures that will be suitable for adult spawning.


View looking downstream of the protected bank (March, 2009)


A wood structure which was constructed this past summer, that is beginning to collect drift wood.


View looking downstream on a parallel wood structure which has a tree lodged against it (March, 2009).


Conducting a wood structure and habitat condition inspection prior to the expected April/May freshet.


View looking from above, on a portion of the parallel wood structure.

Vandalism to a live, mature cedar tree at a roadside campsite.

Upstream end of the over-flow channel which is cutting through the forest. Evidence of tree cutting is shown.

Remnant trees stumps exist as a result of campers cutting live trees.

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