

**Pacific Salmon Foundation
Strategic Salmon Recovery Plan
FINAL REPORT
Squamish Watershed Salmon Recovery Plan (SSRP)**

Please submit completed applications to:

Jim Shinkewski
Director – Salmon Programs
Pacific Salmon Foundation
Suite 300 – 1682 West 7th Avenue
Vancouver, BC V6J 4S6

Proponent and Project Background

Applicant's Legal Name: Squamish River Watershed Society

Address, Mailing: Box 1791

Address, Courier: 41820 Rayburn Road, Brackendale, BC, V8B 0B3

Project Manager: Edith Tobe

Title: Executive Director

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List Subcontractors and contact information:

Project Information

Amount Requested from the PSF: \$87,618

Total Project Value: \$656,055

Is this project a result of a previous PSF Project?

YES

NO

Project Start Date: January 1st, 2007

Project End Date: December 1st, 2007

Please attach proposal, maps and other relevant document¹

Project Title: Mamquam Floodplain Restoration

Project Activity Type:

Habitat Assessment

Stock Assessment

Education and Awareness

Habitat Rehabilitation

Stock Rehabilitation

Stewardship and Community Planning

Target Species: coho, chum, chinook, pink salmon, steelhead, cutthroat, herring, char.

¹ Projects will be considered based on the recommendations of the Squamish Salmon Recovery Plan and will exclude the Cheakamus River at this time while recovery options are being explored by CN Rail. If you are interested in applying for a project related to the Cheakamus River please contact the Project Manager and she can provide recommendations.

Project Relevance and Significance

Provide a brief overview of the project: (Describe the relevance and significance to the PSF Recovery Plan. How does this project address the sustainability or rebuilding of the target species, what limiting factors does this project address.)

This proposal expanded the scope on the previous works of the Mamquam Reunion project and focused on restoring and improving tidal estuary habitats within the Mamquam River floodplain, including the now isolated Mamquam Blind Channel and Wilson Slough (an arm of the Blind Channel). The 2007 works began with the rehabilitation of side channel habitats on the Mamquam River floodplain in the area known as Mashiter Channel. Numerous floodplain and tidal channels of the Mamquam Rivers had been isolated by the construction of highway and railway corridors over the last 100 years. Tidal channels, that have not supported juvenile salmonids for decades were once more provide high quality rearing habitats for coho and chinook salmon juveniles throughout the year.

BC Georgia Basin coho salmon populations have experienced declines in overall abundance over the past decades as a result of declining ocean survivals and decreasing freshwater production, as watersheds have been developed to serve the growing human population within the basin. Human population growth within Georgia Basin continues to increase and the future viability of many coho populations is in question. In 2001, Fisheries and Oceans Canada identified the Squamish River watershed as a the top priority for salmon stock recovery planning within the Lower Fraser Area due to its high existing and potential fishery value and because of the threats to salmon production from development within the watershed. In 2003, the Pacific Salmon Endowment Fund Society, the Pacific Salmon Foundation and the Squamish River Watershed Society, working with all three levels of government, Squamish First Nation, industry and community partners began a formal Salmon Recovery Plan process for the Squamish River watershed. Human development of floodplain areas was identified as a present and future threat to the viability of many coho salmon populations within the watershed. Both protection and restoration of these floodplain habitats, and this project in particular was given a high priority by the Salmon Recovery Workgroup. The District of Squamish is growing at a rapid rate, partly as a result of the 2010 Olympics, the Highway #99 is being widened and upgraded through the Loggers Lane watershed and the relatively undeveloped lands of that watershed are being considered for either protection or development so the timing of this restoration action is critical.

New fish friendly culverts were installed in 2006 at a number of locations along the Vancouver-Whistler Highway 99 corridor by Sea to Sky Improvement Project, providing benefits for the Mashiter Channel, Britannia Slough, Mamquam Blind Channel Wilson Slough. This years works 2007 re-connected the eastern and western tidal portions of the Loggers Lane Creek / Mamquam Blind Channel watershed and developed new groundwater flows into the Mashiter Channel. The culvert installations were specifically designed as an enhancement legacy of the highway project that will complement the Mamquam River floodplain and Squamish Estuary restoration works.

The CN railway corridor, which isolated the Mamquam Blind Channel from the central Squamish River estuary, was breached by a new water control structure funded by CN Rail which will allow rearing salmonids full use of both habitats by the spring of 2008.

The 2007 contribution requested from the SSRP allowed further restoration of the tidal habitats adjacent to these two new structures and provided excellent habitat for juvenile chinook, coho, chum and pink salmon during their estuary rearing phase and improve conditions for the annual herring return and the foreshore marine aquatic vegetation that is so important to the herring and other fisheries species.. The SSRP contribution also supported a joint venture to improve water flows into the Mashiter Channel an important coho and chum salmon habitat on the Mamquam River floodplain.

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What species, life stage does this project target: Juvenile and smolt stages for multi salmonid species as well as cutthroat and steelhead (primarily focusing on coho stocks) including spawning adults

Describe the specific objectives that were delivered by the end of this project:

Objective # 1 Produced upwards of 4,500 square metres of tidal and off channel rearing habitat

Objective # 2 Replanted marsh and riparian vegetation in the newly constructed habitat areas

Objective # 3 Installed informational signs that will enhance awareness of the ecological value of estuaries

Objective # 4 Developed further partnerships with Canadian Hydro, CN Rail, Sea to Sky Improvement Project and others

Describe methods, including environmental protection, timing, site and post project monitoring and reporting plans, triggers and responses for adaptive management:

A hydrological study and flow model of the Loggers Lane and Mamquam Blind Channel watershed has been developed by Hay and Company consultants, for the partners in this project, to identify necessary upgrades, replacements and installations of culverts or channels to ensure adequate flow conveyance or fish passage to potential fish habitats within that watershed. This model is being used to develop operating principles that will safely allow tidal flows into the upper Mamquam Blind Channel, Wilson and Britannia Sloughs for the benefit of fish without compromising flood protection of adjacent lands. Discussions between the Squamish District and CN Rail on how to manage fish passage and tidal flows under the CN Rail corridor and the hydrological model that is being used as a tool to guide this project were held. Restoration of the Mashiter Channel commenced with the new culvert installation beneath Highway 99 at a lower elevation to allow for deepening the channel into the water table to improve flows. Design criteria were developed by Fisheries and Oceans professionals which are a partner with the SRWS in this project

The 2007 SSRP funding contributed to a portion of the physical rehabilitation works identified during this process. Technical design and supervision of the physical works were delivered either by professional consultants, such as in the case of the CN Rail and Highway 99 crossings or by Fisheries and Oceans Canada restoration professionals, in the case of the channel restoration options proposed. Standard engineering and environmental principles were applied to all the projects undertaken. Project management and administration were delivered by the Squamish River Watershed Society. Land ownership, potential contaminated sediment monitoring and other urban land issues will be lead by District of Squamish environmental staff with assistance from the other partners in the project.

- Contributed to the multi-agency effort to develop a Salmon Recovery Plan and this projects goals and objectives complements that plan.
- Specific discussions and with DFO regarding this project, who are responsible for the management of fish habitat and salmon populations in watershed.
- Specific discussions with Squamish First Nation regarding how this project would impact existing aboriginal rights and titles and partnership opportunities.
- Specific discussions with District of Squamish regarding how this project would reflect land use priorities as identified in the Squamish District Official Community Plan.

The 2005 and 2006 projects demonstrated the depth of commitment by the many partners interested in the overall goal of restoring the Mamquam River floodplain and its estuary through the overwhelming response in both direct capital contributions but also in-kind assistance in project design and approvals. This is a strong partnership with a clear vision and purpose.

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If required, has the design been approved by a Professional Engineer and/or Biologist? YES NO
Is this project utilizing recognized or emerging technologies? N/A YES NO
If so please provide supporting argument for its selection:
Will this project require long-term maintenance? YES NO
If yes, what are the anticipated annual costs?
Who will fund it?

Monitoring of project will be carried out by members of SRWS, DFO, SN and local Streamkeepers members. Squamish Nation technicians enumerate spawning salmon on the Mamquam River and its tributaries each season and would be asked to include this area in their survey. When maintenance is identified the partners will develop both a funding and implementation strategy. This relationship is long established in the Squamish watershed and works well. Habitat restoration projects located within the larger Squamish River watershed support over 40,000 spawning salmon each season and have been successfully monitored, maintained and protected over the last two decades. The costs for this will be incorporated into the annual budget of the Streamkeepers, DFO technical support, and the Squamish River Watershed Society. As well, the District of Squamish has set aside an annual sum of \$1,000 towards maintenance and upkeep of the intake and channels.

Performance Expectations

List as described in the Request for Proposal

Measures of Success

Describe any specific objective standards, quantifiable criteria and quality control measures that will be used to assess the actual performance of this project against expectations. Provide a monitoring and evaluation plan that is appropriate and achievable for quantifying fish benefits:

- Run scenarios on the hydrological model of the Loggers Lane/ Mamquam Blind Channel watershed that are consistent with restoration works proposed for 2007 to ensure all interests are considered. January 2007.
- Survey and design – Winter 2006/2007.
- Approvals by landowners for areas targeted for restoration in 2007 –April-May 2007.
- Meeting between DS, SN, DFO and the Squamish River Watershed Society to finalize operating agreement to manage tidal water flows into the Wilson Slough and upper Mamquam Blind Channel. July 2007.
- Fabrication and materials acquisition- Pending funding announcements.
- Construction- Scheduled tentatively for June- October 2007.
- Site reclamation- October 2007.
- Monitoring- November-March 2007-2008.
- Final Report April 1, 2008.

Milestones

Break the project into discrete sequential tasks, and provide the expected task completion date

Task	Completion Date
Detailed Design and Approvals	April 2007
Contracting	May 2007
Engineering and Site Preparation	October 2007
Construction: Site Preparation and Clearing	October – March 2008
Construction: Channel Excavation and Habitat Site Grading	October – March 2008

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Construction: Bank Stabilization and Re-vegetation	March 2008
Monitoring: Fish Use Study and Vegetation Community regrowth	April 2008 – July 2009
Completion Reporting	March 2008

Project Budget

Labour

Please specify if the service is provided by employee, contractor or volunteer.

Service	# of People	Daily Rate	Total # of Days	Total Cost	SSRP Contribution
Project Manager	1	475/day	22	10450	
Senior Biologist Design and Construction	1	600/day	10	6000	
Senior Engineering Design and Direction	1	700/day	10	7000	
Engineering/Drafting Support	1	500/day	10	5000	
Construction Supervision	1	400/day	30	12000	
Project Labour	1	200/day	10	4000	
Professional Biologist (consultant)	1	900/day	5	4500	
(Biological Monitoring)	1	500/day	5	2500	
Labour Sub-Total A				51450	

Materials & Equipment

Items may include site equipment, site materials and supplies, vehicles or other transportation rental or charter, travel, expenses, maintenance, permits, etc.

Item	Details	# of Units	Unit Cost	Total Cost	SSRP Contribution
Heavy Hydraulic Excavator	Excavation, trucking to remove excavated material, and mobilization and demobilization.			144065.77	54757.15
Welding & Repairs				2012.44	13178.42
Rock	Armouring			10732.50	10732.50
Grass Seeding				678.55	678.55
Plants	plants to re-vegetate disturbed site			977.45	977.45
Signage & Kiosk				5121.16	5121.16
Materials & Supplies				3200.21	2172.77
Culvert Installations across Highway 99	Sea to Sky Improvement Project (including maintenance)			200000.00	
Culvert Installation across Rail lines into Wilson Slough	CN Rail including electronic flood gate			300000.00	
Total	Materials and Equipment Sub-Total B			656055.58	87618.00

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Administration and Overhead Costs

The cumulative total of administration and overhead costs, including Watershed Recovery Plan Information and Coordination contracts are limited to a maximum by watershed. Please contact PSF for additional information.

Item	# of Units	Unit Cost	Total Cost	SSRP Contribution
Pay Roll processing/invoicing/Project Budgeting		20/hr	2280	
Office space/computers		\$274/month	3288	
Telephone/Fax/Cell phone			500	
Office Supplies (printer cartridges, etc)			300	
Printing/Photocopying			300	
Courier/Postage			150	
Miscellaneous (i.e. software)				
Insurance			100	
Administration (Total BCRP Contribution to Administration is not to exceed 5% gov't and 10% non-gov't of the BCRP Contributions for A + B			Sub-Total	6918

TOTAL EXPENSES	TOTALS (A+B+C)	\$656055.58	\$87618.00
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Non--PSF Contributions

The term revenue is defined here to include cash, in-kind and volunteer contributions.

Non-PSF Revenue Sources	Cash	In-Kind	Volunteer	TOTAL
Fisheries and Oceans Canada		18438		18438
MOT		50000		50000
CN Rail		300000		300000
Sea to Sky Improvement		200000		200000
Non-PSF Totals				568438

Certification

I certify that the information provided in this application, including all attachments, is accurate to the best of my knowledge and that I am authorized to sign on behalf of the stated organization.

Signature: Edith B. Tobe

Date: November 8th, 2007

(Authorized Signatory)

Name: Edith B. Tobe
(Print Name)