



***LOWER MAINLAND BCH
HABITAT RESTORATION
2000-2001***

***ALOUETTE RIVER
T10-T11 Salmonid Habitat Project***

Alouette River Off-Channel Rehabilitation 2000-2001

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Summary:

Location: Work site is approximately 1.7 km north of the gate access to BC Hydro's private road to the Alouette Dam that is opposite the Alouette Regional Correctional Centre in Maple Ridge.

BC Watershed Code: 100-026700-06000-00000-0000-0000-000-000-000-000-000-000

Map References NRC NTS Map 92G/7
BCGS TRIM Map 92G.028

UTM Co-ordinates Zone 10: 535300mE, 5456200mN (NAD27)

F&O Drawings: Habitat Improvement Works T10-T11 Tributary Creeks to the South Alouette River, Revision 1

Cost Summary:

<i>Funding</i>	<i>Amount</i>
Total Funds	\$14926
BC Hydro-F&O MOU Fund 1999-2000	
Fisheries Renewal BC 2000-2001	
BC Hydro 2000-2001	\$9926
Fisheries & Oceans Canada	\$5 000
	(in kind)

Habitat Constructed:

<i>Feature</i>	<i>Length</i>	<i>Area</i>
overwintering pond	n/a	500m ²
newly accessible stream habitat	1000m	1500m ²
Total Habitat	n/a	2000m²



Summary: 2

1 Introduction:..... 4

1.1 Background4

1.2 Need Statement.....4

1.3 Purpose.....4

1.4 Objectives.....5

2 Site Location:..... 5

3 Methods: 5

3.1 Equipment5

3.2 Construction5

3.3 Monitoring and Assessment5

4 Results:..... 6

4.1 Project Description6

4.2 Habitat Quantities and Estimated Production:.....6

5 Recommendations: 6

6 Acknowledgements:..... 6

7 References: 6

8 Figures:..... 7

9 Appendix: Financial Statement 10



1 Introduction:

1.1 Background

The habitat works continue a long-term program to rehabilitate off-channel habitats along the Alouette River mainstem.

Land ownership issues delayed the undertaking of this project previously. Resource Restoration resolved any land ownership issues during the past winter and BC Hydro agreed to co-fund the project.

The project known as T10-11 involves re-establishing access to two tributaries of the Alouette River which were cut off by construction of the hydro dam access road. The proposed project creates additional off-channel habitat.

To address limiting factors for coho salmon success, off-channel habitat creation rather than lateral logjam or river side-channel rehabilitation is the preferred technique. Extreme ranges of river flows typical of the watershed make the risk of damage to restoration work in the active floodplain too great. For the Alouette River, the productivity of coho salmon is limited primarily by the amount of critical off-channel habitat available.

1.2 Need Statement

The Alouette River dam construction significantly decreased the amount of habitat available to the anadromous salmonids. Decreased total flow, base flows and an altered hydrograph in the river downstream of the dam, along with reduced sediment transport capability and wood debris transport to downstream reaches have contributed to a fundamental change in the lower Alouette River and the habitats used by anadromous salmonid fish. Loss of side-channel and off-channel habitats and a reduction in the quality of the mainstem habitats has impacted species dependent upon off-channel habitats as well as species who use the off-channel habitat. Both species dependent upon side-channel and off-channel habitat and those that simply use it are suffer from the effects of lost side-channels and reduced. Many of the impacts cannot be mitigated with current land use within the watershed and historic salmonid production levels are unattainable. Off-channel habitat rehabilitation is a promising technique for improving the salmonid carrying capacity of the Alouette River.

The construction of the road has disconnected many mountain streams draining the eastern Alouette River Valley. This particular project addresses problems created by the road directly and only helps to assuage the typical Alouette River problems.

Fish species such as coho salmon are critically dependent on woody debris lateral logjams, stable side-channels with wood debris and groundwater-fed off-channels for providing summer and winter habitat. All these habitats are heavily used by coho salmon for spawning, rearing an overwintering.

Also, other species of fish such as chum, chinook, steelhead and pink salmon use these waterbodies in high densities for spawning and rearing.

1.3 Purpose

Fisheries and Oceans Canada over the last decade has implemented a program to restore non-functioning off channel habitats along the Alouette River. Since 1993, BC Hydro has co-funded much of the work. The rehabilitation completed thus far has increased available critical off channel habitat for salmonid species such as coho. Fish use of the restored habitat has been high. But Alouette River coho stocks remain depressed. Habitat areas are still available for restoration as part of F&O's continuing commitment to improving the health of the Alouette River to assist coho salmon and other Alouette fish.



1.4 Objectives

Between 2000 and 2006, the Alouette River has several opportunities for annual funding to complete restoration activities. Every five years, restoration opportunities and target fish populations could be reviewed and evaluated for cost-benefit assessment.

2 Site Location:

The Alouette River Management Society has co-operated with Fisheries & Oceans and BC Hydro since the beginning of the 1990's to construct fish habitat in and around the Alouette Regional Corrections Centre.

The T10-T11 Salmonid Habitat project continues supporting aquatic habitat restoration. The off-channel pond fish access structures are located along the BC Hydro Alouette River Dam access road.

The Alouette River is catalogued in the BC watershed atlas as 100-026700-06000. The reach of river this project feeds is shown on Natural Resources Canada National Topographic System map 92G/7 and Geodata British Columbia TRIM map 92G.028. The position of the fish access structure is approximately 535300 metres east, 5456200 metres North, using Universal Transverse Mercator co-ordinates for Zone 10U with the 1927 North American Datum.

3 Methods:

3.1 Equipment

To complete the work, the contractor supplied

- Finning Caterpillar 320 Tracked Excavator and Hitachi EX-200 Tracked Excavator
- Two Tandem-Axle Dump trucks

3.2 Construction

To improve fish access into suitable rearing habitat and expand existing off-channel rearing habitat, Alouette River Management Society and Fisheries and Oceans Resource Restoration partnered with BC Hydro to restore fish access across the BC Hydro roadway and build an off-channel pond.

The works included installation of a new 600mm diameter corrugated steel culvert, construction and installation of a timber pool-and-weir fish ladder and overflow control structures at the existing culverts, as well as construction of associated channels. The T10 outlet control also forces a pond to form upstream of its road culvert in a low ravine and raises the outlet water level so a short channel yields a suitable waterway to the new culvert and fishway.

The culvert and fishway were installed first, followed by the excavation for the channel. Finally, the outlet controls were installed so that the majority of work was completed before water was introduced to the system.

3.3 Monitoring and Assessment

Alouette River Management Society will monitor and evaluate the success of the fishway and the usage of the pond. Salmonid—particularly coho—use of the site and structures should be confirmed.



4 Results:

Since this is a habitat restoration construction project, the results are the physical works as well as the quantities of productive habitat and expected production yield.

4.1 Project Description

Works constructed between July 31, 2000, and August 3, 2000, included:

- install 14m long, 600mm diameter corrugated steel pipe culvert beneath the Alouette River Dam access road between T10 and T11 creeks
- assemble and install wooden fishway to downstream end of 600mm diameter culvert.
- excavate a channel along east side of Alouette Dam road to appropriate elevations, ensuring water flow from T10 and T11 creeks to the culvert and fishway
- install steel overflow structure for T11 culvert
- seal a proposed pond east of the road beside the existing T10 culvert with silty material from Mud Creek
- install a wooden overflow box on existing T10 culvert
- Excavate and create a channel to join the flow from the fishway to the existing outlet flow from the culvert for T10

4.2 Habitat Quantities and Estimated Production:

<i>Feature</i>	<i>Habitat</i>		<i>Coho smolt Production</i>	
	<i>Length</i>	<i>Area</i>		
• newly accessible stream habitat	1000m	1500m ²		
• overwintering pond	n/a	500m ²		
• Total	n/a	2000m ²	0.5 solts/m ²	1000 smolts

5 Recommendations:

The project is built and complete. Resource Restoration would like to recommend an additional opportunity for the Alouette River Management Society (project proponent):

- monitor fishway, culvert, and overflow structures for debris and sediment jamming

6 Acknowledgements:

Bridge Coastal Fish and Wildlife Restoration Program, BC Hydro, for providing funding for the project.

BC Hydro Property Rights Management for permitting fish habitat construction on BC Hydro lands.

7 References:

Resource Restoration Unit, Fisheries and Oceans Canada. "Pitt River System: Alouette River T10-T11 Tributary Access Improvements". Fisheries and Oceans Construction Reports. Delta: 2001.

Resource Restoration Unit, Fisheries and Oceans Canada. "Bridge River Coastal 2000/2001 Projects". Proposal Document. Delta: 2000.



8 Figures:

Figure 1.
*Channel along east
side of Alouette Dam
road (looking south).*

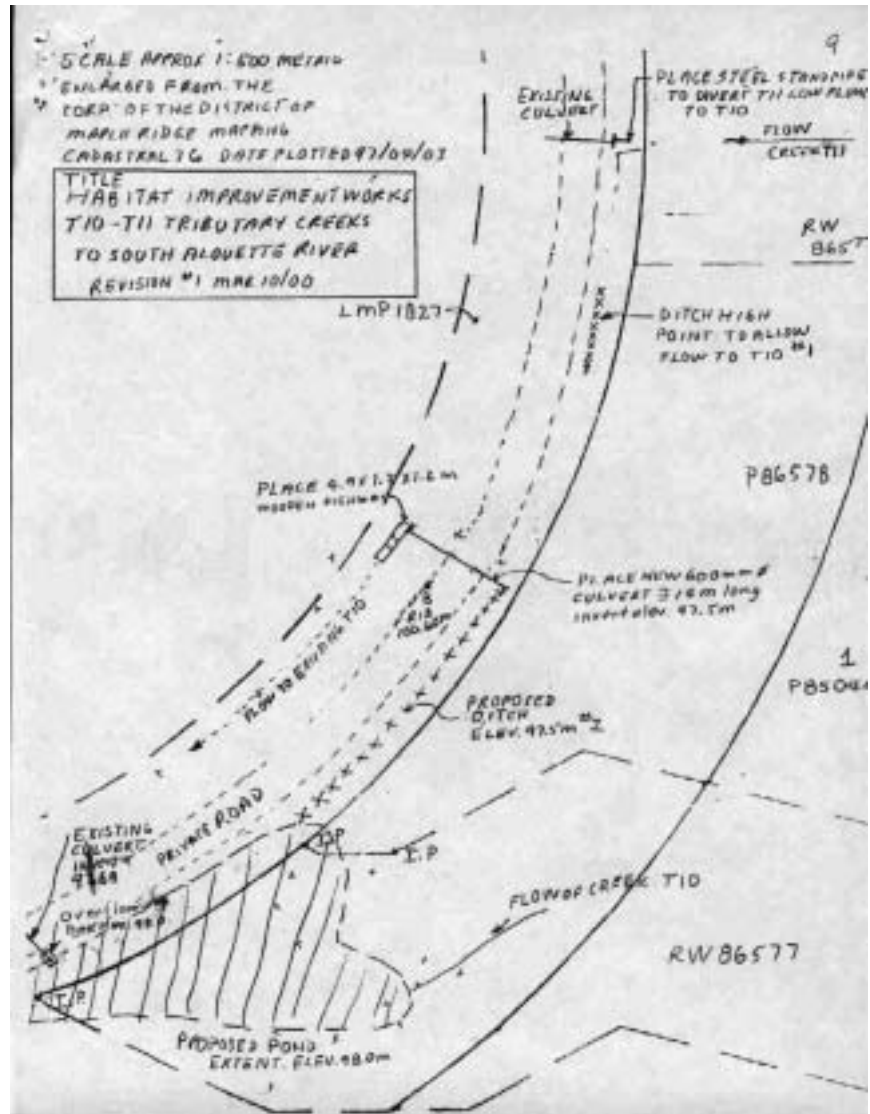


Figure 2.
*Location of new
Pond on east side of
Alouette Dam road
(looking north,
before construction).*





Figure 5.
Detail sketch of site
listing habitat
improvements.





9 Appendix: Financial Statement

Notes:

<i>Item</i>	<i>Description</i>	<i>Income</i>	<i>Expense</i>	<i>Totals</i>
1	Funding			
	BCHydro-F&O MOU Funds	9926		
	Subtotal Funding			9926
2	In-kind Support			
2.1	Fisheries & Oceans Canada (Professional and Technical Support)	5000		
	Subtotal In-kind Support			5000
3	Expenditures			
3.1	Equipment	5731		
3.2	Materials (pipe, fishway, flow control structures)	4195		
3.4	Technical Site Supervision		2000	
3.5	Professional Support		3000	
	Subtotal Expenditures			14926