Project Completion Abstract

Fish Passage Activity (Engineering Activities) -

SUBMIT COMPLETED FORM TO DISTRICT MANAGER AND FIA ADMINISTRATOR AFTER PROJECT COMPLETION

SECTION A – GENERAL INFORMATION

Recipient: *(name & division)* Weyerhaeuser Company Limited

Forest Region / District: Southern Interior / Cascades

Watershed Name / Operating Area: Red Creek

FIA File No.: _____ / _____

FIA Investment Schedule No.: SOTSA228158____

FIA Project No.: 8158002_____

Fiscal Year Project Completed: 2010-2011

Road Type: *(✓check only one)*
- ☐ Forest Service Road
- ☒ Road Permit Road (pre-1995)
- ☐ Non-status road

Road Name *(formal)*: Road permit R07751-34-14

Road File / Ref. No.: R07751-34-14

Project Location: *(road km)*: 26.1km

UTM Coordinates: *(attach a key map)*: Zone 10: 702,543 / 5,493,532

Priority Stream Fish Passage Restoration Project:
(✓check if applicable)
- ☐ Modifications to a Structure or Stream Channel
- ☐ Structural Repairs to a Major Culver or Bridge
- ☐ Culvert Removal & Stream Channel Works
- ☒ Culvert Removal & Major Culvert or Bridge Installation

- ☐ New or Replacement Bridge
- ☐ Structural Repairs to Bridge
- ☒ New or Replacement Major Culvert
- ☐ Structural Repairs to Major Culvert

Stream Name / Stream Classification / Fish Species:
Red Creek / S3 / Rainbow trout

Check one (article 5.2):
- ☒ **Conventional bridge/culvert OR**
- ☐ **Proprietary system or Non-conventional bridge / culvert**

PROJECT PRIORITY DETERMINATION
- **Reasonable investment (pre-2008/09) in:**

☐ site plans ☐ designs ☐ pre-purchased materials
- **Watershed Group Ranking: 1**
- **Protocol assessment score:** 21

☐ **Other Rationale**: (*attach justification)*

Crossing Name:	**MFR Site No. / Structure No.:**	**Project Completion Date:**
Red 2		October 8, 2010.

Objectives of the overall project

The objective of the project was to restore upstream fish passage to 8.0 km of upstream habitat in Red Creek. This stream is classified as an S3, has rainbow trout and is not within a Community Watershed.

Names/Affiliation of Registered Professionals Involved in the Project

Michael Foster, R.P.F, P. Eng., Forsite Consultants Ltd.

Stephen Jones, R.P.F., Southern Interior ForestCraft Ltd.

Ed Collen, R.P.F., Weyerhaeuser Company Limited

Lyle Unwin, P. Eng., Onsite Engineering Ltd.

Author(s) of the Project Completion Abstract:
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Name of Watershed / Sub-basin, & Location

The name of the watershed is Hayes Creek and the sub-basin name is Red Creek. The work area is located at 26.1km on a road permit road originally constructed in 1990. The site is accessed from the Summerland Princeton Road, turning east onto the Red Creek FSR. Take the right hand road at the 2.5km junction (Red FSR not Finnegan FSR) and travel to 26.0km on the Red-Isintok FSR, then turn north onto this permitted road. A key map is attached.

Introduction

The report "2008 Fish Passage Culvert Assessments, Cascades Forest District FIA Project SOTSA185045001", Karen Grainger, R.P.Bio, November 2008 identified this location as an upstream barrier to rainbow trout migration in Red Creek with a score of 21. The existing culvert had been installed circa 1990 and had the following characteristics: was not embedded, had a 3cm outlet drop and was too narrow for the stream width (photos 1). A hydrologic assessment and new crossing design were completed March 13, 2009 and the supply and installation of the structure occurred October 2010.

The assessments that contributed to the decision to restore fish passage at this crossing are:

"2008 Fish Passage Culvert Assessments, Cascades Forest District FIA Project SOTSA185045001", Karen Grainger, R.P.Bio., November 2008. The score according to the March 2008 Fish Passage Protocol methodology was 21.

Description of Design

The design details and requirements were to restore fish passage by restoring natural channel width and structure at

the road crossing and to remove the outlet drop. The assumptions and criteria used in the design were L100 loading. The rationale for choosing a 12.802m long x 3.05m span x 1.60m rise steel arch culvert was that it restored fish passage for less than the cost of a bridge.

Description of Completed Work

Instead of installing the planned 12.802m long x 3.05m span x 1.60m rise steel arch culvert, an aluminum arch culvert of similar dimensions was installed (12.344m long x 3.046m span x 1.579m rise). Reasons for the change to aluminum are not fully known as the contractor was responsible for supplying the culvert however, it may have been that the steel culvert was not ordered ahead of time or was not manufactured by mistake.

The site was seeded with Weyerhaeuser Mid-Upper Elevation Common #1 Forage Mixture composed of: 20% Dahurian wildrye, 15% Orchard grass, 15% Single cut red-clover, 15% Slender Wheatgrass, 10% Annual rye grass, 10% Alsike clover, 10% White clover and 5% Timothy grass.

Cost Summary

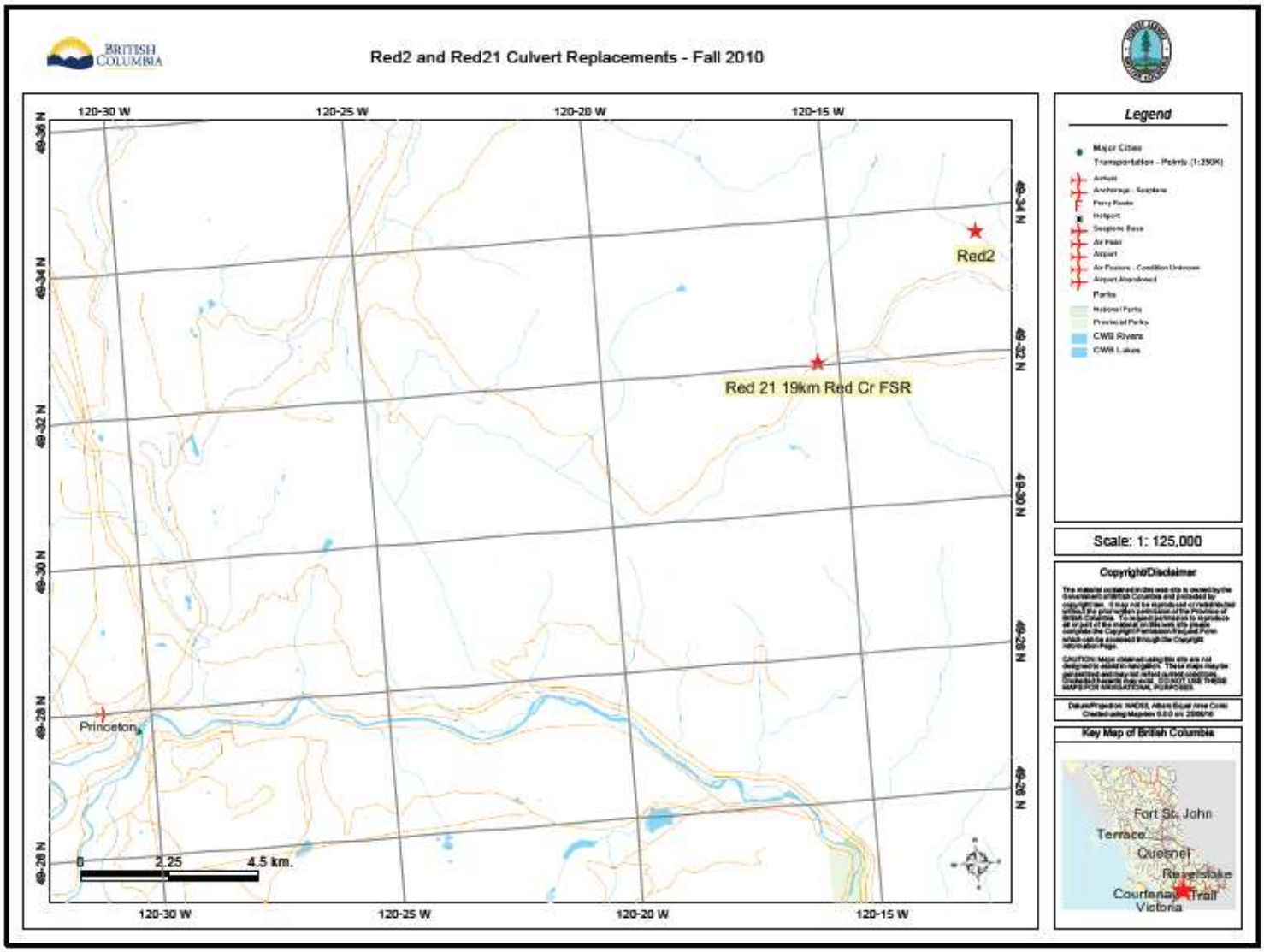
Design Cost	$	3,138.72	7.5%
Supply and Installation Cost	$	38,665.00	92.5%
Total Cost	$	41,803.72	100.0%
Total Length of Accessed Habitat (m)		8,000	
Restored Stream Unit Cost ($/m)	$	5.23	
Structure Unit Cost ($/m of length)	$	3,386.56	

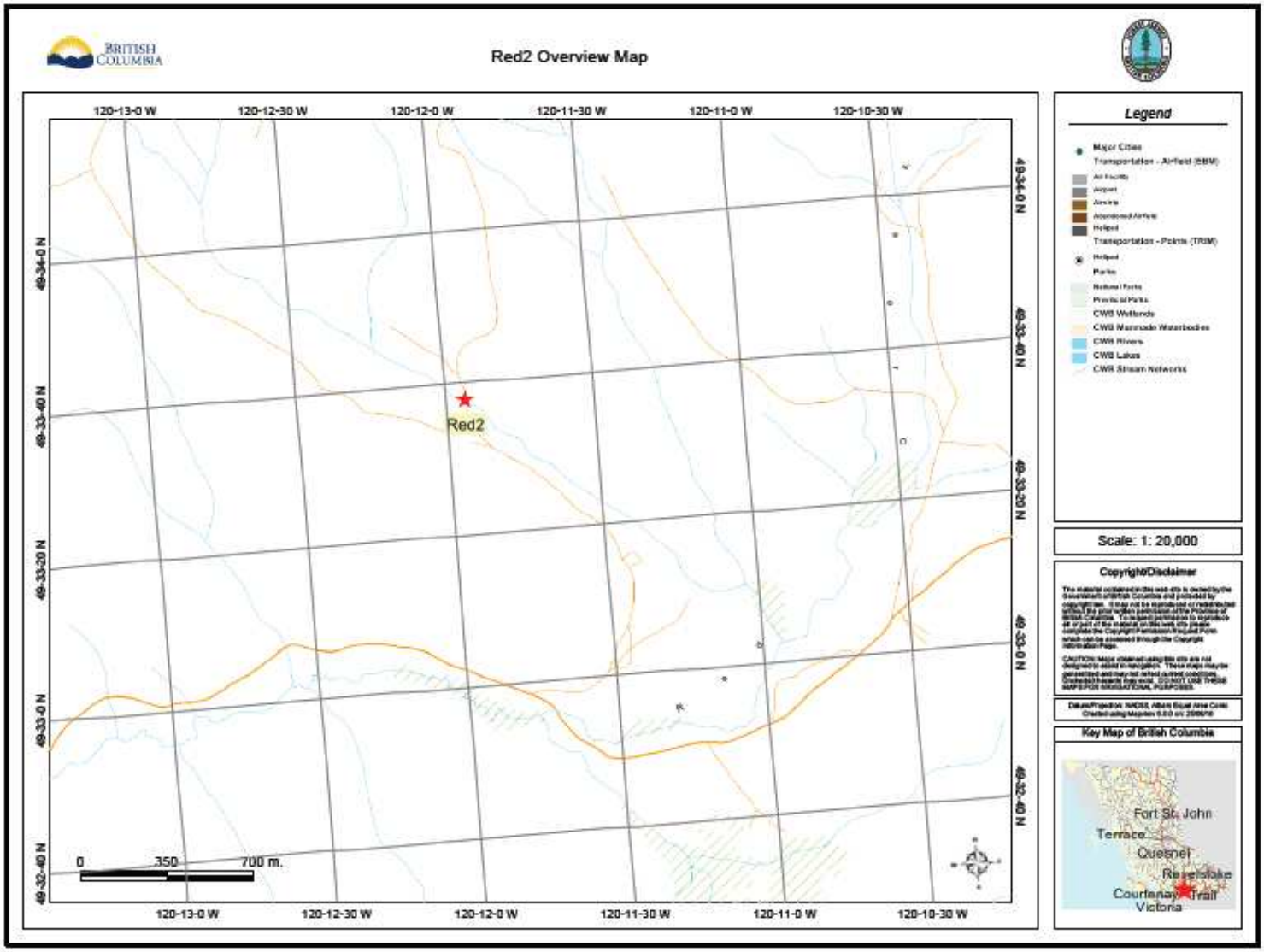
Post-construction Inspection A post-construction inspection is recommended in spring 2011. The purpose is to assess the integrity and performance of the structure after the first freshet and to schedule the next inspection of the structure.

Photographs

Photo 1: Outlet of old Red2 culvert showing no embedment, a 3 cm outlet drop, and a culvert that does not maintain natural stream width. At low flows, water depth would prevent upstream fish passage whereas the natural channel was always passable.

Photo 2: Completed new structure. Red arrows indicate same trees and same rock in photo 1 above.


Red2 and Red21 Culvert Replacements - Fall 2010
120-30 W
120-25 W
120-20 W
120-15 W
49-36 N
49-34 N
49-32 N
49-30 N
49-28 N
49-26 N
Red2
Red 21 19km Red Cr FSR
Princeton
0
2.25
4.5 km.
Legend
Major Cities
Transportation - Points (1:250K)
Parks
CWB Rivers
CWB Lakes
Scale: 1: 125,000
Copyright/Disclaimer
Key Map of British Columbia
Fort St. John
Terrace
Quesnel
Revelstoke
Courtenay
Trail
Victoria


Red2 Overview Map
120-13-0 W
120-12-30 W
120-12-0 W
120-11-30 W
120-11-0 W
120-10-30 W
49-34-0 N
49-33-40 N
49-33-20 N
49-33-0 N
49-32-40 N
Red2
0
350
700 m.
Legend
Major Cities
Transportation - Airfield (CBM)
Transportation - Points (TRIM)
Parks
CWB Wetlands
CWB Manmade Waterbodies
CWB Rivers
CWB Lakes
CWB Stream Networks
Scale: 1: 20,000
Copyright/Disclaimer
Key Map of British Columbia
Fort St. John
Terrace
Quesnel
Revelstoke
Courtenay
Trail
Victoria