

**Fish Passage Culvert Assessments: South West Vancouver Island, B.C.  
Completed in TSA 38 of the Alberni Watershed Group, South Island Forest District**

**Objectives**

The objectives of the Fish Passage Culvert Assessments were to:

- Evaluate fish passage at pre-selected closed bottom structures at stream crossings within two high priority watersheds located within TSA 38 on West Vancouver Island.
- Determine if the culverts investigated presented a barrier to fish passage.
- Collect fish habitat characteristics at each crossing.
- Determine if each crossing met the eligibility criteria for a fish passage restoration project.

**FIA Investment Schedule Number and Project Number**

**Investment Schedule:** COTSA386811

**Project Number:** 6811001

**Fiscal Year:** 2008/2009

**Recipient Name and Division/MoF District/MoF Region**

**MoF Region:** Coast Forest Region

**Recipient:** BCTS, Campbell River Forest District Business Area

**Project Area:** South Island Forest District

**Author(s) and/or Registered Professionals of the Project Completion Abstract**

Cedric Robert, CCEP, Dipl. Tech.

[cbrobert@ecodynamics.ca](mailto:cbrobert@ecodynamics.ca)

Rider Petch, B.Sc., R.P.Bio.

[rpetch@ecodynamics.ca](mailto:rpetch@ecodynamics.ca)

Isaac Anderton, B.Sc., R.P.Bio.

[ianderton@ecodynamics.ca](mailto:ianderton@ecodynamics.ca)

ECODynamic Solutions (EDS) Inc.

Unit 214-A, 2459 Cousins Ave.

Courtenay, BC V9N 3N6

Phone/Fax: (250) 334-3039

**Watershed/Stream and Location**

The two watersheds selected for the study as per Mackinnon (2008a) included the Toquart River (20.4 km; 84.3 km<sup>2</sup>) and Lucky Creek (n/a; 37.4 km<sup>2</sup>). Stream length and watershed area are included in brackets. All systems are located within the Alberni Watershed Group and discharge to the west side of Vancouver Island.

**UTM Coordinates (NAD83) and Watershed**

Watershed	UTM <sup>1,2</sup>		Watershed Code <sup>2</sup>	
	Zone	Easting		Northing
Toquart R.	10U	327793	5433916	930-230500
Lucky Cr.	10U	331520	5432976	930-227800

<sup>1</sup> UTM at mouth.

<sup>2</sup> Data from RSS

**Introduction**

In 2008/2009, ECODynamic Solutions (EDS) Inc. was contracted by BC Timber Sales, to conduct fish passage assessments at closed bottom structures within two priority watersheds in TSA 38. The road networks specified for investigation under the Contract were limited to Forest Service Roads (FSR), pre-1995 Road Permit Roads, and Non-Status Roads within the target watersheds. This was the first project on Vancouver Island to adhere to the new FIA methodologies for fish passage assessment documented in MacKinnon (2008a and 2008b). Crossings with potential upstream habitat value were targeted for fish passage assessment to ensure habitat connectivity. The priority watersheds were confirmed as valuable fish habitat to all or some of the Pacific salmon and numerous resident fish species.

**Assessments and Prescriptions**

A total of 52 crossings were pre-approved by BCTS for investigation and a total of 48 sites were visited by the end of the field program. Of these 48 crossing sites, 19 were corrugated steel pipe (CSPs) culverts, 16 were wooden box culverts, 10 were bridges, and 3 sites were deactivated. Field assessments were completed

between January 18 and February 20, 2009 and were conducted only at closed bottom structures in fish-bearing waters as per Mackinnon (2008b). All culverts were assessed as being passable, a potential barrier or complete barrier to fish passage. Of the 19 CSPs visited, two were determined to be in fish habitat and both were assessed as a complete barrier to fish passage.

Considering the potential linear distance of habitat gain upstream of the crossing (HGI) and fish habitat quality at the crossing, a restoration priority was proposed for the two assessed culvert crossings, including projected costs and a cost benefit analysis. Options to restore each culvert were presented as either culvert removal, installation of an open bottom structure, installation of a simulated streambed design culvert, or embedding and backwatering of the existing structure.

Based on habitat limitations, neither of the two culverts were prioritized for restoration in 2009 or 2010, and instead the low value habitat sites will be prioritized in the future based on long term operational requirements.

#### Cost Summary Information

<b>Total Project Cost:</b>	<b>\$21,354.91</b>
----------------------------	--------------------

#### For Further Information, Contact:

Cedric Robert, CCEP, Dipl. Tech. or  
Rider Petch, B.Sc., R.P.Bio

ECODynamic Solutions (EDS) Inc.  
Unit 214-A, 2459 Cousins Ave.  
Courtenay, BC V9N 3N6  
Phone/Fax: (250) 334-3039  
Email: [cbrobert@ecodynamics.com](mailto:cbrobert@ecodynamics.com)

#### References

Mackinnon, G. 2008a. Fish Passage Protocol for Culverted Sites. BC Ministry of Environment. 1st Edition, March 2008. Revised June, 2008. 13 pages.

Mackinnon, G. 2008b. Field Assessment for Fish Passage Determination of Closed Bottomed Structures. BC Ministry of Environment. 2nd Edition, May 2008. 19 pages.

#### Photographs



**Photo 1.** View of 2140 mm CSP at crossing 1335 in the Toquart River Watershed, January 2009.



**Photo 2.** View of the hanging 1000 mm culvert at crossing 2557 in the Toquart River Watershed, February 2009.