

Murray Creek

Culvert Assessment Report

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Submitted: October 11, 2011
Revised: January 8, 2014

Acknowledgements

The work detailed in the report was made possible, in part, by funding provided to Fisheries and Oceans Canada by the Ministry of Transportation and Infrastructure.

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1 Introduction

1.1 Project Scope

The scope of this project encompasses all known culverts within the agricultural area of the Murray Creek watershed, including both public road and private road or crossing culverts. However, due to landowner rights in Canada, only private culverts for which permission has been granted by the landowner were measured. Eight private culverts were measured, however, this leaves an estimated 5-7 culverts on private land in which the landowner could not be reached, or did not grant access to their land.

1.2 Project Objectives

The objective of this project was to provide a detailed assessment of culvert status as it relates to fish passage in the Murray Creek watershed, and prioritize the need for replacement of these culverts for future Murray Creek rehabilitation projects.

1.3 Project Location

The location for this project encompassed the agricultural areas of the Murray Creek watershed. A map of the Murray Creek watershed project area can be found in Appendix 5.1.

2 Field Survey Techniques

The culvert assessment techniques used in this project followed the British Columbia Ministry of Environment's "Field Assessment for Fish Passage Determination of Closed Bottom Structures, 3rd Edition; May, 2009.

3 Results and Recommendations

Out of 24 culvert sites that were measured, 16 were public and 8 were private. Of these twenty one culverts measured, 7 sites were ranked as high replacement priority, 7 as medium to high replacement priority, 3 as medium replacement priority, 3 as low to medium priority replacement, and 4 as low replacement priority. The replacement ranking of these culverts was based on a combination the B.C. MOE's fish barrier score, and the stream priority rank for Murray Creek. The stream priority rank was produced for the Murray Creek rehabilitation project circa 2009 based on reach breaks and fish habitat values. A table summary of the culvert replacement priority ranking can be found in Appendix 5.2. The results and recommendations for each assessed site can be found in sections 3.1 through 3.24.

3.1 CMP01

Table

Date (mm/dd/yy)	9/20/2011		
Crossing ID #	CMP01		
Crew Name	OA/LN		
Stream Name	Murray Creek		
UTM	Easting	Northing	
	10U	433514	5987094
Road Name	Loop Road		
Crossing Type	Round Culvert	Outlet Residual Pool (m)	0.68
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	0	Fill Depth (m)	1.5
Culvert Width (m)	5.1	Valley Fill (m)	Deep Fill
Channel Width (m)	5.4	Habitat Value	High
Stream Width Ratio (m)	1.06	Beaver Activity	No
Culvert Slope %	0.06	Backwatered	100
Stream Slope %	1.5	Fish Sighted?	Yes
Culvert Length (m)	20		
Fish Barrier Result			
Score	16	Result	Potential Barrier
Stream Priority Rank	1		
Recommendation			
Stream priority rank 1, habitat value high, provides connectivity from river to upstream spawning and rearing areas. This culvert is considered to be a potential barrier. This culvert is considered to be a medium to high priority replacement .			
Comments			
This culvert is considered to be a partial barrier, in addition the culvert is constricting and slowing the stream just before it enters the river, which affects the natural flushing of sediments at the confluence and as a result stream morphology. Fish may be able to pass through the culvert at this time, due to the sediment barrier just downstream of the culvert created by the disposition of sediment from the Nechako River. This barrier has caused Murray Creek to back up increasing the depth of the outlet residual pool, creating slack water through and upstream of the culvert. The stream now drains through a small side channel to the east. This sediment barrier at the mouth may blow out during the next freshet. Until then, fish passage will have to be through the small side channel. This culvert should be removed and replaced with a bridge or larger arch culvert, which does not constrict flow and allows natural stream flow as Murray Creek, enters the Nechako.			
Photos	6		

Photos

CMP01- Inlet looking (South)



CMP01- Inlet looking upstream (North)



CMP01- Outlet looking upstream (North)



CMP01- Sediment bar from outlet (South)



CMP01- Outlet & sediment barrier (North)



CMP01- New stream outlet looking (East)



3.2 CMP (02-03)

Table

Date (mm/dd/yy)	4/13/2011		
Crossing ID #	CMP02/03		
Crew Name	OA/LN		
Stream Name	Murray Creek		
UTM	Easting	Northing	
10U	429889	5990208	
Road Name	Loop		
Crossing Type	Round Culvert	Outlet Residual Pool (m)	0.65
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	0	Fill Depth (m)	9.4
Culvert Width (m)	1.52	Valley Fill	Deep Fill
Channel Width (m)	1.78	Habitat Value	Low
Stream Width Ratio (m)	1.17	Beaver Activity	No
Culvert Slope %	1.2	Backwatered	0
Stream Slope %	0.5	Fish Sighted?	No
Culvert Length (m)	32		
Fish Barrier Result			
Score	24	Result	Barrier
Stream Priority Rank	1		
Recommendation			
Fish Barrier, stream priority rank 1, habitat value low, but provides connectivity up and down stream to good habitat value areas. High priority replacement.			
Comments			
Culvert is very undersized, causing flow restriction, upstream sediment disposition creation of a wetland, and lack of channel scouring upstream of the inlet. The outlet discharge is too fast and is at an angle which is causing severe erosion of the far north bank.			
Photos	5		

Photos

CMP (02-03) – Inlet looking (West)



CMP (02-03) – Inlet looking (South)



CMP (02-03) – Outlet looking (North)



CMP (02-03) - Outlet downstream (SE)



CMP (02-03) – Outlet Barrel



3.3 CMP04

Table

Date (mm/dd/yy)	4/14/2011		
Crossing ID #	CMP04		
Crew Name	OA/LN		
Stream Name	Murray Creek		
UTM	Easting	Northing	
	10U	429831	5990337
Road Name	Snell Rd East		
Crossing Type			
	Round Culvert	Outlet Residual Pool (m)	0.7
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	0	Fill Depth (m)	2.8
Culvert Width (m)	2	Valley Fill	Deep Fill
Channel Width (m)	1.72	Habitat Value	Low
Stream Width Ratio (m)	0.86	Beaver Activity	No
Culvert Slope %	0.7	Backwatered	0
Stream Slope %	0.7	Fish Sighted?	No
Culvert Length (m)	15.1		
Fish Barrier Result			
Score	13	Result	Passable
Stream Priority Rank			
	1		
Recommendation			
Passable, stream priority rank 1, low habitat value. Low to medium replacement priority.			
Comments			
Although cattle are currently fenced out up and down stream, past cattle use has eroded channel banks, deposited sediments, and damaged riparian vegetation. The area has little riparian shrub composition and is dominated by grasses. The channel is not distinguishable in some areas at low flow as it is choked by grasses.			
Photos			
	5		

Photos

CMP04 - Inlet looking (North)



CMP04 - Inlet looking upstream (North)



CMP04 - Outlet looking (South)



CMP04 - Outlet looking downstream (South)



CMP04 - Outlet Barrel



3.4 CMP05

Table

Date (mm/dd/yy)	4/14/2011		
Crossing ID #	CMP05		
Crew Name	OA/LN		
Stream Name	Murray Creek		
UTM	Easting	Northing	
10U	429075	5991962	
Road Name	Northside		
Crossing Type			
	Round Culvert	Outlet Residual Pool (m)	0.65
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	0	Fill Depth (m)	1.8
Culvert Width (m)	2	Valley Fill	Deep Fill
Channel Width (m)	2	Habitat Value	Low
Stream Width Ratio (m)	1	Beaver Activity	No
Culvert Slope %	0.5	Backwatered	0
Stream Slope %	0.5	Fish Sighted?	No
Culvert Length (m)	18.3		
Fish Barrier Result			
Score	16	Result	Potential Barrier
Stream Priority Rank			
	1		
Recommendation			
Potential Barrier. Stream priority rank 1, low habitat value.			
Medium to high priority culvert replacement			
Comments			
The stream width ratio is currently 1, however the private culvert downstream approximately 200 m has backed up and slowed the creek, causing suspended sediments to fall out and collect, changing the gradient and creating a wetland. As a result this may have diminished upstream channel size of this site causing the stream width to be smaller than pre-culvert conditions. If this is the case as suspected, the culvert may be more undersized than the data indicates and a high priority culvert replacement.			
Photos			
	5		

Photos

CMP05 - Outlet looking (South)



CMP05 - Outlet looking downstream (South)



CMP05 - Inlet looking (North)



CMP05 - Inlet looking upstream (North)



CMP05 - Outlet Barrel



3.5 CMP (06-07)

Table

Date (mm/dd/yy)	4/15/2011		
Crossing ID #	CMP (06-07)		
Crew Name	OA/BF		
Stream Name	Murray Creek		
UTM	Easting	Northing	
10U	429935	5992715	
Road Name	Larson Rd		
Crossing Type			
	Round Culvert	Outlet Residual Pool (m)	0.67
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	0	Fill Depth (m)	0.75
Culvert Width (m)	1.05	Valley Fill	Deep Fill
Channel Width (m)	1.27	Habitat Value	Low
Stream Width Ratio (m)	1.21	Beaver Activity	No
Culvert Slope %	2.6	Backwatered	0
Stream Slope %	1.5	Fish Sighted?	No
Culvert Length (m)	12.2		
Fish Barrier Result			
Score	18	Result	Potential Barrier
Stream Priority Rank			
	1		
Recommendation			
Potential Barrier. Rank 1 stream priority, low habitat value, however, upstream has high habitat value. Medium to high replacement priority.			
Comments			
Directly above and below this culvert, have been influenced by past and current occasional cattle use. The stream has moved from its original course downstream which may have been influenced by the positioning of the culverts. Not only should the culverts be replaced, but a prescription to rehabilitate the creek itself is in order.			
Photos			
	5		

Photos

CMP (06-07) - Inlet looking (West)



CMP (06-07) - Inlet looking upstream (East)



CMP (06-07) - Outlet looking (East)



CMP (06-07) - Outlet downstream (West)



CMP (06-07) - Inlet Barrel



3.6 CMP10

Table

Date (mm/dd/yy)	4/15/2011		
Crossing ID #	CMP10		
Crew Name	OA/LN		
Stream Name	Unnamed Tributary to East Murray Creek		
UTM	Easting	Northing	
10U	430314	5990328	
Road Name	Snell Rd East		
Crossing Type			
	Round Culvert	Outlet Residual Pool (m)	1
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	0	Fill Depth (m)	0.9
Culvert Width (m)	1.2	Valley Fill	Deep Fill
Channel Width (m)	1.8	Habitat Value	Low
Stream Width Ratio (m)	1.5	Beaver Activity	No
Culvert Slope %	2.8	Backwatered	0
Stream Slope %	4	Fish Sighted?	No
Culvert Length (m)	26		
Fish Barrier Result			
Score	29	Result	Barrier
Stream Priority Rank			
	NA		
Recommendation			
Barrier. Stream priority is not ranked, low habitat value. Low replacement priority.			
Comments			
This culvert is very much considered to be a barrier; however this is only a seasonal drainage with little to no scouring upstream. As there is no water later in the year, this is a low replacement priority.			
Photos			
	5		

Photos

CMP10 – Inlet looking (North)



CMP10 – Inlet looking (North)



CMP10 – Outlet looking (South)



CMP10 – Outlet downstream (South)



CMP10 – Outlet Barrel



3.7 CMP11

Table

Date (mm/dd/yy)	4/15/2011		
Crossing ID #	CMP11		
Crew Name	OA/LN		
Stream Name	East Murray Creek		
UTM	Easting	Northing	
10U	430585	5990322	
Road Name	Snell Rd East		
Crossing Type			
	Round Culvert	Outlet Residual Pool (m)	1.6
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	30	Fill Depth (m)	0.9
Culvert Width (m)	2.4	Valley Fill	Deep Fill
Channel Width (m)	5.3	Habitat Value	Moderate
Stream Width Ratio (m)	2.21	Beaver Activity	No
Culvert Slope %	1	Backwatered	0
Stream Slope %	1	Fish Sighted?	No
Culvert Length (m)	24		
Fish Barrier Result			
Score	29	Result	Barrier
Stream Priority Rank	1		
Recommendation			
Barrier. Stream priority rank 1, moderate habitat value. High priority culvert replacement.			
Comments			
This culvert is undersized for this reach and a barrier and needs to be replaced. Past and current cattle use has deteriorated the section upstream of the culvert and it is in bad shape. Cow's have been recently kept out of the creek downstream of culvert and is in somewhat better condition. This section of stream is an important migration corridor to habitat up and down stream.			
Photos	5		

Photos

CMP11 – Inlet looking (North)



CMP11 – Inlet upstream (North)



CMP11 – Outlet looking (South)



CMP11 – Outlet downstream (South)



CMP11 – Outlet Barrel



3.8 CMP12

Table

Date (mm/dd/yy)	4/15/2011		
Crossing ID #	CMP12		
Crew Name	OA/LN		
Stream Name	East Murray Creek		
UTM	Easting	Northing	
10U	431517	5990581	
Road Name	Northside Rd		
Crossing Type	Round Culvert	Outlet Residual Pool (m)	1.5
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	0	Fill Depth (m)	2.8
Culvert Width (m)	2.8	Valley Fill	Deep Fill
Channel Width (m)	6	Habitat Value	Low
Stream Width Ratio (m)	2.14	Beaver Activity	No
Culvert Slope %	4.5	Backwatered	0
Stream Slope %	1	Fish Sighted?	No
Culvert Length (m)	23		
Fish Barrier Result			
Score	29	Result	Barrier
Stream Priority Rank	1		
Recommendation			
Barrier. Rank 1 stream priority, low habitat value due to past livestock use. Medium to high culvert replacement priority.			
Comments			
This culvert is undersized for this reach, is considered a barrier and needs to be replaced. Past cattle use has deteriorated the section downstream of the culvert and cows need to be excluded to help the stream recover. This section of stream is an important migration corridor to habitat up and down stream. This culvert also has a manually operated metal sheet flow restriction device used to restrict flow through the culvert and raise the water level upstream for irrigation purposes by the landowner. This may cause a temporary migration barrier for fish when it is in use. Development of another system for irrigation would be ideal.			
Photos	5		

Photos

CMP12 – Inlet looking (East)



CMP12 – Inlet upstream (East)



CMP12 – Outlet looking (West)



CMP12 – Outlet downstream (West)



CMP12 – Outlet Barrel



3.9 CMP (13-14)

Table

Date (mm/dd/yy)	4/13/2011		
Crossing ID #	CMP (13-14)		
Crew Name	OA/LN		
Stream Name	McIntosh Creek		
UTM	Easting	Northing	
10U	431919	5991905	
Road Name	McLeod Pit		
Crossing Type			
	Round Culvert	Outlet Residual Pool (m)	0.4
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	0	Fill Depth (m)	0.5
Culvert Width (m)	1.5	Valley Fill	Deep Fill
Channel Width (m)	2.5	Habitat Value	Low
Stream Width Ratio (m)	1.67	Beaver Activity	No
Culvert Slope %	1.4	Backwatered	0
Stream Slope %	1.4	Fish Sighted?	No
Culvert Length (m)	11.5		
Fish Barrier Result			
Score	21	Result	Barrier
Stream Priority Rank			
	2		
Recommendation			
Barrier. Stream priority rank 2, low habitat value. Medium to high culvert replacement priority.			
Comments			
There are three undersized culverts at this site of which only two are functioning. They are likely a barrier, and habitat value is low downstream due to past cattle use of the stream, and slightly better upstream with good willow cover.			
Photos			
	5		

Photos

CMP (13-14) - Inlet looking (North)



CMP (13-14) - Inlet upstream (North)



CMP (13-14) - Outlet looking (South)



CMP (13-14) - Outlet downstream (South)



CMP (13-14) - Inlet looking at ditch runoff (East)



3.10 CMP15

Table

Date (mm/dd/yy)	4/14/2011		
Crossing ID #	CMP15		
Crew Name	OA/LN		
Stream Name	Unnamed tributary to East Murray Creek		
UTM	Easting	Northing	
10U	433128	5990828	
Road Name	Striegler Road		
Crossing Type	Round Culvert	Outlet Residual Pool (m)	0.4
Embedded	None	Inlet Drop	Yes
Outlet Drop (cm)	0	Fill Depth (m)	0.344
Culvert Width (m)	0.5	Valley Fill	Deep Fill
Channel Width (m)	0.8	Habitat Value	Low
Stream Width Ratio (m)	1.6	Beaver Activity	No
Culvert Slope %	1.2	Backwatered	0
Stream Slope %	1.4	Fish Sighted?	No
Culvert Length (m)	11.3		
Fish Barrier Result			
Score	21	Result	Barrier
Stream Priority Rank	3		
Recommendation			
Barrier, but habitat value low, stream priority rank 3. Low priority culvert replacement.			
Comments			
This is a seasonal drainage, and is currently dry. There is little scouring and is considered to be low habitat value. The upstream side of the drainage is a recently plowed field with no fish habitat.			
Photos	5		

Photos

CMP15 – Inlet looking (East)



CMP15 – Inlet looking upstream (East)



CMP15 – Outlet looking (West)



CMP15 – Outlet looking downstream (West)



CMP15 – Outlet Barrel



3.11 CMP (16-18)

Table

Date (mm/dd/yy)	4/14/2011		
Crossing ID #	CMP (16,17,18)		
Crew Name	OA/LN		
Stream Name	East Murray Creek		
UTM	Easting	Northing	
10U	433141	5991225	
Road Name	Striegler Road		
Crossing Type	Round Culvert	Outlet Residual Pool (m)	0
Embedded	Partial Continuous	Inlet Drop	No
Outlet Drop (cm)	0	Fill Depth (m)	1
Culvert Width (m)	2.8	Valley Fill	Deep Fill
Channel Width (m)	4	Habitat Value	Moderate
Stream Width Ratio (m)	1.43	Beaver Activity	No
Culvert Slope %	2	Backwatered	0
Stream Slope %	2	Fish Sighted?	No
Culvert Length (m)	15		
Fish Barrier Result			
Score	19	Result	Potential Barrier
Stream Priority Rank	1		
Recommendation			
Stream priority rank 1, and potential barrier. Medium to high culvert replacement priority.			
Comments			
Although there are 3 culverts at this site, and they are only considered a potential barrier, they do slow the water down on the upstream side to facilitate sediment deposit and are beginning to create a wetland with the assistance of cattle use. The habitat value is considered moderate downstream of the culvert, but low upstream.			
Photos	5		

Photos

CMP (16,17,18) – Inlet looking (East)



CMP (16,17,18) – Inlet upstream (East)



CMP (16,17,18) – Outlet looking (West)



CMP (16,17,18) - Outlet downstream (West)



CMP (16,17,18) – Outlet Barrel



3.12 CMP19

Table

Date (mm/dd/yy)	6/7/2011		
Crossing ID #	CMP19		
Crew Name	OA/BF		
Stream Name	Unnamed tributary to East Murray Creek		
UTM	Easting	Northing	
10U	433148	5992079	
Road Name	Striegler Road		
Crossing Type	Round Culvert	Outlet Residual Pool (m)	0.07
Embedded	None	Inlet Drop	Yes
Outlet Drop (cm)	3	Fill Depth (m)	0.7
Culvert Width (m)	0.6	Valley Fill	Deep Fill
Channel Width (m)	1.48	Habitat Value	Low
Stream Width Ratio (m)	2.47	Beaver Activity	No
Culvert Slope %	1	Backwatered	0
Stream Slope %	2.5	Fish Sighted?	No
Culvert Length (m)	14		
Fish Barrier Result			
Score	16	Result	Potential Barrier
Stream Priority Rank	3		
Recommendation			
Potential Barrier. However, stream priority rank 3, low habitat value. Medium replacement culvert priority.			
Comments			
This stream crosses Striegler Road three times (CMP20/CMP19/CMP25) and then runs down the ditch downstream of CMP25 for about 300 m before entering Murray Creek below CMP16-17-18.			
Photos	5		

Photos

CMP19 – Inlet looking (East)



CMP19 – Inlet looking (West)



CMP19 – Outlet looking (West)



CMP19 – Outlet Barrel



3.13 CMP20

Table

Date (mm/dd/yy)	4/13/2011		
Crossing ID #	CMP20		
Crew Name	OA/LN		
Stream Name	Unnamed tributary to East Murray Creek		
UTM	Easting	Northing	
10U	433625	5992298	
Road Name	Striegler Road		
Crossing Type			
	Round Culvert	Outlet Residual Pool (m)	0.2
Embedded	None	Inlet Drop	Yes
Outlet Drop (cm)	0	Fill Depth (m)	0.98
Culvert Width (m)	0.6	Valley Fill	Deep Fill
Channel Width (m)	2.5	Habitat Value	Low
Stream Width Ratio (m)	4.17	Beaver Activity	No
Culvert Slope %	1.9	Backwatered	0
Stream Slope %	0.06	Fish Sighted?	No
Culvert Length (m)	14		
Fish Barrier Result			
Score	21	Result	Barrier
Stream Priority Rank			
	3		
Recommendation			
Barrier. However, stream priority rank 3, low habitat value. Medium replacement priority.			
Comments			
This stream crosses Striegler Road three times (CMP20/CMP19/CMP25) and then runs down the ditch downstream of CMP25 for about 300 m before entering Murray Creek below CMP16-17-18.			
Photos			
	5		

Photos

CMP20 – Inlet looking (North)



CMP20 – Inlet upstream (North)



CMP20 – Outlet looking (South)



CMP20 – Outlet downstream (South)



CMP20 – Outlet Barrel



3.14 CMP (22-23)

Table

Date (mm/dd/yy)	4/15/2011		
Crossing ID #	CMP (22-23)		
Crew Name	OA/LN		
Stream Name	East Murray Creek		
UTM	Easting	Northing	
10U	434742	5991063	
Road Name	McLeod		
Crossing Type	Round Culvert	Outlet Residual Pool (m)	0.3
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	0	Fill Depth (m)	0.08
Culvert Width (m)	2.8	Valley Fill	Deep Fill
Channel Width (m)	3	Habitat Value	Moderate
Stream Width Ratio (m)	1.1	Beaver Activity	No
Culvert Slope %	0.04	Backwatered	0
Stream Slope %	0.05	Fish Sighted?	No
Culvert Length (m)	12		
Fish Barrier Result			
Score	13	Result	Passable
Stream Priority Rank	2		
Recommendation			
Passable. Stream priority rank 3, moderate habitat value. Low to medium culvert replacement priority.			
Comments			
These culverts were replaced by the B.C. MOT in the last few years and are considered passable by fish. However, because these two culverts were at the same depth, the culvert widths were added together. This site would be better suited with a larger open bottomed culvert, to help keep stream morphology more natural. Both up and downstream are lacking riparian shrubs and trees and it has been cultivated up to the edge of the stream. The upstream section was recently ditched, fenced and planted with willow, although it is difficult to distinguish a channel as it is vegetated with grasses.			
Photos	5		

Photos

CMP (22-23) – Inlet looking (East)



CMP (22-23) – Inlet upstream (East)



CMP (22-23) – Outlet looking (West)



CMP (22-23) – Outlet downstream (West)



CMP (22-23) – Outlet Barrel



3.15 CMP24

Table

Date (mm/dd/yy)	4/14/2011		
Crossing ID #	CMP24		
Crew Name	OA/LN		
Stream Name	Unnamed tributary to Murray Creek		
UTM	Easting	Northing	
10U	434727	5989396	
Road Name	Northside		
Crossing Type	Round Culvert	Outlet Residual Pool (m)	0
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	0	Fill Depth (m)	1.4
Culvert Width (m)	1	Valley Fill	Deep Fill
Channel Width (m)	NA	Habitat Value	Low
Stream Width Ratio (m)	<1	Beaver Activity	No
Culvert Slope %	0	Backwatered	0
Stream Slope %	0.01	Fish Sighted?	No
Culvert Length (m)	17		
Fish Barrier Result			
Score	13	Result	Potential Barrier
Stream Priority Rank	NA		
Recommendation			
Potential fish barrier. However, very low habitat value, dewatered most of year. Stream has not been priority ranked. Low priority culvert replacement.			
Comments			
This site is a seasonal drainage, with no scouring upstream and overgrown with grasses. Upstream is a hayfield, and downstream is a wetland. This section of steam is considered to have low habitat value.			
Photos	5		

Photos

CMP24 – Inlet looking (East)



CMP24 – Inlet upstream (East)



CMP24 – Outlet looking (West)



CMP24 – Outlet downstream (West)



CMP24 – Outlet Barrel



3.16 CMP25

Table

Date (mm/dd/yy)	6/7/2011		
Crossing ID #	CMP25		
Crew Name	OA		
Stream Name	Unnamed tributary to East Murray Creek		
UTM	Easting	Northing	
10U	433095	5991889	
Road Name	McLeod Pit Rd		
Crossing Type	Round Culvert	Outlet Residual Pool (m)	0.17
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	0	Fill Depth (m)	0.5
Culvert Width (m)	0.6	Valley Fill	Deep Fill
Channel Width (m)	1	Habitat Value	Low
Stream Width Ratio (m)	1.67	Beaver Activity	No
Culvert Slope %	1.5	Backwatered	0
Stream Slope %	1.8	Fish Sighted?	No
Culvert Length (m)	30.5		
Fish Barrier Result			
Score	27	Result	Barrier
Stream Priority Rank	3		
Recommendation			
Barrier. Stream priority rank 3, low habitat value. Medium replacement priority.			
Comments			
This stream crosses McLeod Pit Road three times (CMP20/CMP19/CMP25) and then runs down the ditch downstream of CMP25 for about 300 m before entering Murray Creek below CMP16-17-18.			
Photos	6		

Photos

CMP25 – Inlet looking (North)



CMP25 – Inlet upstream (North)



CMP25 – Outlet looking (South)



CMP25 – Outlet downstream (South)



CMP25 – Inlet culvert barrel (South)



CMP25 – Stream as it enters ditch (West)



3.17 Private CMP01

Table

Date (mm/dd/yy)	4/15/2011		
Crossing ID #	Private CMP01		
Crew Name	OA/LN		
Stream Name	Unnamed tributary to Murray Creek		
UTM	Easting	Northing	
10U	431494	5989379	
Road Name	Private access off of Erickson North		
Crossing Type			
	Round Culvert	Outlet Residual Pool (m)	0.4
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	0	Fill Depth (m)	0.75
Culvert Width (m)	0.5	Valley Fill	Deep Fill
Channel Width (m)	1.5	Habitat Value	Low
Stream Width Ratio (m)	3	Beaver Activity	No
Culvert Slope %	3.5	Backwatered	0
Stream Slope %	2	Fish Sighted?	No
Culvert Length (m)	9		
Fish Barrier Result			
Score	26	Result	Barrier
Stream Priority Rank			
	3		
Recommendation			
Fish barrier. However, priority stream rank 3, low habitat value. Low replacement priority.			
Comments			
This site is a seasonal drainage. Upstream is well vegetated with trees, shrubs, and forbs, and has fine and coarse woody debris. Downstream has been and is still currently used by cattle and as a result the habitat value is low. Water stays in some low watering areas downstream of culvert, but does not flow year round.			
Photos			
	4		

Photos

Private CMP01 – Inlet looking (East)



Private CMP01 – Inlet upstream (East)



Private CMP01 – Outlet looking (West)



Private CMP01 – Outlet downstream (West)



3.18 Private CMP02

Table

Date (mm/dd/yy)	6/7/2011		
Crossing ID #	Private CMP02		
Crew Name	OA/BF		
Stream Name	Shillestead Brook		
UTM	Easting	Northing	
10U	434553	5991236	
Road Name	Private access off of McLeod Rd		
Crossing Type	Round Culvert	Outlet Residual Pool (m)	0.54
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	0.07	Fill Depth (m)	0.25
Culvert Width (m)	0.8	Valley Fill	Deep Fill
Channel Width (m)	1.72	Habitat Value	Low
Stream Width Ratio (m)	2.15	Beaver Activity	No
Culvert Slope %	1	Backwatered	0
Stream Slope %	1.5	Fish Sighted?	No
Culvert Length (m)	9.1		
Fish Barrier Result			
Score	21	Result	Barrier
Stream Priority Rank	1		
Recommendation			
Barrier, low habitat value, but barrier to migration, stream priority rank 1. High priority culvert replacement.			
Comments			
This section of stream deteriorates quickly as it enters the lower gradient area. The stream appears to have been ditched and straightened many years ago as it enters a field. There are some aspen and willow upstream of the culvert, but none downstream. The culvert is considered a barrier to some potentially moderate to good value habitat upstream.			
Photos	5		

Photos

Private CMP02 – Inlet looking (North)



Private CMP02 – Inlet looking (South)



Private CMP02 – Outlet looking (South)



Private CMP02 – Outlet looking (North)



Private CMP02 – Outlet Barrel



3.19 Private CMP03

Table

Date (mm/dd/yy)	6/11/2011		
Crossing ID #	Private CMP03		
Crew Name	OA		
Stream Name	Murray Creek		
UTM	Easting	Northing	
10U	429501	5991111	
Road Name	Private access off of Loop Rd		
Crossing Type			
	Round Culvert	Outlet Residual Pool (m)	0.52
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	0	Fill Depth (m)	0.95
Culvert Width (m)	0.97	Valley Fill	Deep Fill
Channel Width (m)	1.63	Habitat Value	Low
Stream Width Ratio (m)	1.68	Beaver Activity	No
Culvert Slope %	1	Backwatered	0
Stream Slope %	1	Fish Sighted?	No
Culvert Length (m)	13.5		
Fish Barrier Result			
Score	21	Result	Barrier
Stream Priority Rank			
	1		
Recommendation			
Fish barrier, stream priority rank 1, low habitat value, however barrier to good habitat value up and down stream. High priority culvert replacement.			
Comments			
This culvert is considered a barrier. Willow and aspen line most of the stream through this section. This section is recovering from past cattle use. The stream is very turbid from upstream sediments. There are few gravels or cobbles. The substrate is dominated by clay and sediments.			
Photos			
	5		

Photos

Private CMP03 – Inlet looking (North)



Private CMP03 – Inlet looking (South)



Private CMP03 – Outlet looking (South)



Private CMP03 – Outlet downstream (South)



Private CMP03 – Outlet Barrel



3.20 Private CMP04

Table

Date (mm/dd/yy)	6/11/2011		
Crossing ID #	Private CMP04		
Crew Name	OA		
Stream Name	Murray Creek		
UTM	Easting	Northing	
10U	429045	5991660	
Road Name	Private access off of Northside Rd		
Crossing Type	Round Culvert	Outlet Residual Pool (m)	0.05
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	24	Fill Depth (m)	0.1
Culvert Width (m)	1.18	Valley Fill	Deep Fill
Channel Width (m)	2.55	Habitat Value	Low
Stream Width Ratio (m)	2.16	Beaver Activity	No
Culvert Slope %	2	Backwatered	0
Stream Slope %	1.5	Fish Sighted?	No
Culvert Length (m)	9		
Fish Barrier Result			
Score	26	Result	Barrier
Stream Priority Rank	1		
Recommendation			
Fish barrier, stream priority stream rank 1, low habitat value, however barrier to good habitat value up and down stream. High priority culvert replacement.			
Comments			
This site once had three culverts. Only two are still functioning and both culverts have raised inlets and outlets. This has caused upstream sediment disposition creation of an extensive wetland, and lack of channel scouring upstream of the inlet. One of the culverts was either taken out or washed out sometime in the past which has helped alleviate some of the flow restriction from these undersized culverts, but not eliminated the problem. Cattle were just recently fenced out of this area and the wetland is showing signs of recovery.			
Photos	5		

Photos

Private CMP04 – Inlet looking (North)



Private CMP04 – Inlet upstream (North)



Private CMP04 – Outlet looking (South)



Private CMP04 – Outlet downstream (South)



Private CMP04 – Outlet Barrel



3.21 Private CMP05

Table

Date (mm/dd/yy)	6/11/2011		
Crossing ID #	Private CMP05		
Crew Name	OA		
Stream Name	McIntosh Creek		
UTM	Easting	Northing	
10U	432074	5991151	
Road Name	Private access off of Northside Rd		
Crossing Type	Round Culvert	Outlet Residual Pool (m)	0.43
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	0	Fill Depth (m)	1.61
Culvert Width (m)	0.89	Valley Fill	Deep Fill
Channel Width (m)	2.55	Habitat Value	Low
Stream Width Ratio (m)	2.87	Beaver Activity	No
Culvert Slope %	1	Backwatered	0
Stream Slope %	1	Fish Sighted?	No
Culvert Length (m)	13		
Fish Barrier Result			
Score	24	Result	Barrier
Stream Priority Rank	2		
Recommendation			
Fish barrier, stream priority rank 2 , low habitat value, however barrier to good habitat value up and down stream. High priority culvert replacement.			
Comments			
This culvert is undersized and considered a barrier. This section of the stream is directly behind a dairy. The substrate is dominated by a heavy layer of silt, evidence of past manure management practices. However, it does appear as evidenced by an earthen berm, in which the dairy operator is attempting to prevent additional manure waste from directly entering the stream.			
Photos	5		

Photos

Private CMP05 – Inlet looking (North)



Private CMP05 – Inlet upstream (North)



Private CMP05 – Outlet looking (South)



Private CMP05 – Outlet Looking (North)



Private CMP05 – Inlet Barrel



3.22 Private CMP06

Table

Date (mm/dd/yy)	6/7/2011		
Crossing ID #	Private CMP06		
Crew Name	OA/BF		
Stream Name	Shillestead Brook		
UTM	Easting	Northing	
10U	434599	5992137	
Road Name	Private access off of McLeod Rd		
Crossing Type	Round Culvert	Outlet Residual Pool (m)	NA
Embedded	NA	Inlet Drop	NA
Outlet Drop (cm)	NA	Fill Depth (m)	NA
Culvert Width (m)	0.6	Valley Fill	Deep Fill
Channel Width (m)	2.45	Habitat Value	Moderate
Stream Width Ratio (m)	4.08	Beaver Activity	No
Culvert Slope %	NA	Backwatered	NA
Stream Slope %	2	Fish Sighted?	No
Culvert Length (m)	6.3		
Fish Barrier Result			
Score	NA	Result	NA
Stream Priority Rank	1		
Recommendation			
These culverts are presently washed out and although in stream are not functioning. Landowners need to cross to get to fields. High priority culvert replacement.			
Comments			
This section of stream has a higher gradient, and its subdominant substrate consists of gravels which may be suitable for spawning. There are still willows and aspen present along the stream banks which offers shade and cover. However, cows are still permitted unfettered access to the stream which has caused erosion and sedimentation. The three culverts still present instream have been washed out and are no longer functioning. However, the landowner needs to have them replaced in order to access the field on the other side.			
Photos	5		

Photos

Private CMP06 – Inlet looking (South)



Private CMP06 – Inlet looking (Southwest)



Private CMP06 – Outlet looking (North)



Private CMP06 – Outlet looking (Northeast)



Private CMP06 – Outlet looking downstream (South)



3.23 Private CMP07

Table

Date (mm/dd/yy)	6/21/2011		
Crossing ID #	Private CMP07		
Crew Name	OA		
Stream Name	Unnamed tributary to McIntosh Creek		
UTM	Easting	Northing	
10U	431730	5992237	
Road Name	Private Access off of McLeod Pit Rd		
Crossing Type	Round Culvert	Outlet Residual Pool (m)	0
Embedded	None	Inlet Drop	Yes
Outlet Drop (cm)	0	Fill Depth (m)	0.35
Culvert Width (m)	0.6	Valley Fill	Deep Fill
Channel Width (m)	1.39	Habitat Value	Low
Stream Width Ratio (m)	2.32	Beaver Activity	No
Culvert Slope %	1	Backwatered	0
Stream Slope %	1.2	Fish Sighted?	No
Culvert Length (m)	4.45		
Fish Barrier Result			
Score	18	Result	Potential Barrier
Stream Priority Rank	NA		
Recommendation			
Culvert is undersized; however, stream is more likely seasonal NCD. Currently totally dry. Low fish habitat value. Low to medium priority culvert replacement.			
Comments			
This drainage runs through hay field, there is no definable channel except on either side of the culvert. Although the culvert is undersized, it is not a high priority to replace this culvert based on habitat values.			
Photos	5		

Photos

Private CMP07 – Inlet looking (West)



Private CMP07 – Inlet upstream (West)



Private CMP07 – Outlet looking (East)



Private CMP07 – Outlet downstream (East)



Private CMP07 – Outlet looking (West)



3.24 Private CMP08

Table

Date (mm/dd/yy)	6/21/2011		
Crossing ID #	Private CMP08		
Crew Name	OA		
Stream Name	McIntosh Creek		
UTM	Easting	Northing	
10U	432160	5992288	
Road Name	Private Access off of McLeod Pit Rd		
Crossing Type	Round Culvert	Outlet Residual Pool (m)	0.03
Embedded	None	Inlet Drop	No
Outlet Drop (cm)	8	Fill Depth (m)	0.57
Culvert Width (m)	0.63	Valley Fill	Deep Fill
Channel Width (m)	1.96	Habitat Value	Moderate
Stream Width Ratio (m)	3.11	Beaver Activity	No
Culvert Slope %	1.8	Backwatered	0
Stream Slope %	1.5	Fish Sighted?	No
Culvert Length (m)	5.95		
Fish Barrier Result			
Score	21	Result	Barrier
Stream Priority Rank	3		
Recommendation			
Culvert is a barrier. Stream is priority ranked as a 3, however the stream is considered moderate fish habitat. Medium to high culvert replacement priority.			
Comments			
The culvert is in need of replacement; it is undersized and is position incorrectly in the stream to one side. The stream has some spawning gravels, good willow cover, some deep pools and undercut banks.			
Photos	5		

Photos

CMP08 – Inlet looking (North)



CMP08 – Inlet upstream (Northeast)



CMP08 – Outlet looking (Southwest)



CMP08 – Outlet looking (Southwest)



CMP08 – Culvert barrel (Northeast)

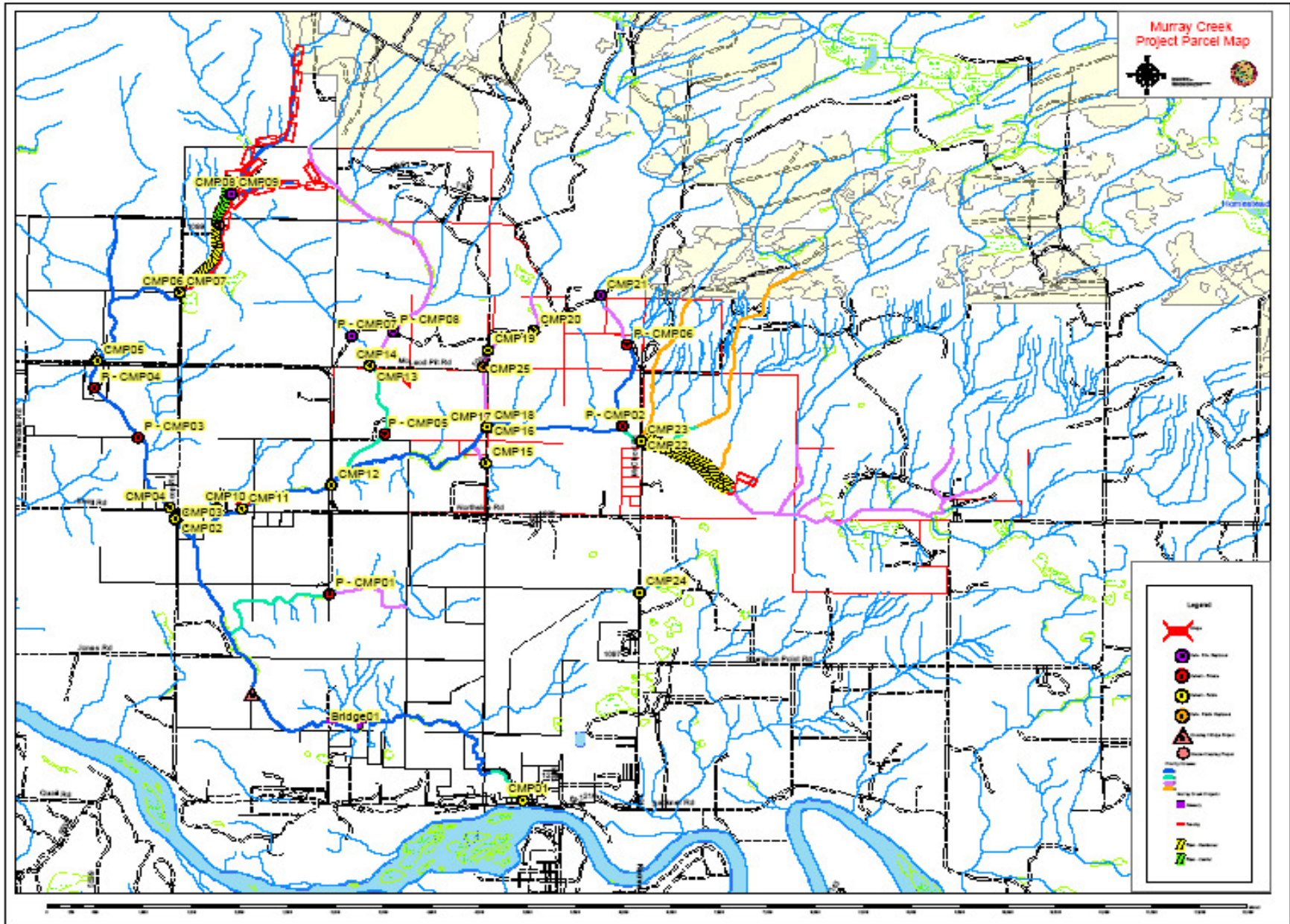


4 References

B.C. Ministry of Environment. 2009. Field Assessment for Fish Passage Determination of Closed Bottom Structures. 3rd Edition

5 Appendices

5.1 Area Map



5.2 List of Coordinates, Culvert Status, and Replacement Priority Ranking

Culvert ID	UTM	Easting	Northing	Status	Rank
CMP01*	10U	433514	5987094	Medium to high priority culvert replacement	2
CMP02-03	10U	429890	5990208	High priority culvert replacement.	1
CMP04	10U	429831	5990337	Low to medium replacement priority	4
CMP05	10U	429075	5991962	Medium to high priority culvert replacement	2
CMP06-07	10U	429935	5992715	Medium to high priority culvert replacement	2
CMP08-09**	10U	430472	5993805	Already Replaced	0
CMP10	10U	430314	5990328	Low priority culvert replacement	5
CMP11	10U	430585	5990322	High priority culvert replacement.	1
CMP12	10U	431517	5990581	Medium to high priority culvert replacement	2
CMP13-14	10U	431919	5991905	Medium to high priority culvert replacement	2
CMP15	10U	433128	5990828	Low priority culvert replacement	5
CMP16-17-18	10U	433140	5991222	Medium to high priority culvert replacement	2
CMP19	10U	433148	5992079	Medium priority culvert replacement	3
CMP20	10U	433625	5992298	Medium priority culvert replacement	3
CMP21**	10U	434320	5992687	Already Replaced	0
CMP22-23*	10U	434742	5991063	Low to medium replacement priority	4
CMP24	10U	434729	5989395	Low priority culvert replacement	5
CMP25	10U	433095	5991889	Medium priority culvert replacement	3
Private CMP01	10U	431494	5989379	Low priority culvert replacement	5
Private CMP02	10U	434553	5991236	High priority culvert replacement.	1
Private CMP03	10U	429501	5991111	High priority culvert replacement.	1
Private CMP04	10U	429045	5991660	High priority culvert replacement.	1
Private CMP05	10U	432074	5991151	High priority culvert replacement.	1
Private CMP06	10U	434599	5992137	High priority culvert replacement.	1
Private CMP07	10U	431730	5992237	Low to medium replacement priority	4
Private CMP08	10U	432160	5992288	Medium to high priority culvert replacement	2

* District of Vanderhoof jurisdiction.

** MFLNRO jurisdiction or private pit access.

All other public road crossings are MOTI jurisdiction.

Rank Description	Rank Score
Low	5
Low medium	4
Medium	3
Medium high	2
High	1
Already replaced	0