

FISH PASSAGE – CULVERT INSPECTIONS

FIA Investment Schedule: NOTSA032309

FIA Activity Number: 2309002 (FIRS)

BABINE RIVER and NILKITKWA RIVER WATERSHEDS

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Funding for this project was provided by the Forest Investment Account (Province of B.C.) through Pacific Inland Resources, a division of West Fraser Mills Ltd.

January, 2005



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Acknowledgements

The Fish Passage – Culvert Inspection project within Pacific Inland Resources (PIR's) operating area was funded by the Forest Investment Account (FIA) through Pacific Inland Resources, a division of West Fraser Mills Ltd. Field work was conducted by Dan Brookes, Ralph Kossman and Heather Ziegler. Kent Coish (PIR) provided assistance and direction during the pre-field office planning stage.

Executive Summary

Silvicon Services Inc. was retained by Pacific Inland Resources Ltd. (a Division of West Fraser Mills, Ltd.) to carry out a Fish Passage-Culvert Inspection (FPCI) project within the Nilkitkwa River Watershed and a portion of the Babine River Watershed. In the ***Land Base Investment Rationale*** prepared by West Fraser Mills Ltd. for the Bulkley Management Unit and dated March 31, 2003, fish passage-culvert inspections address several strategic resource management objectives that currently exist for the Bulkley TSA (more specifically, items 4 and 5 on page 3, items 4 and 5 Section 2 on page 4 and Strategy (4b) on page 7). Funding for this project was provided by the Forest Investment Account.

Historical inventory information obtained from the “Fishwizard” software program, the Fisheries Information Summary System (FISS) and 1:20 000 RIC Reconnaissance Inventory maps have determined that sport-fish populations of rainbow trout (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentus*), cutthroat trout (*Oncorhynchus clarki*), and Dolly Varden (*Salvelinus malma*) and anadromous populations of steelhead (*Oncorhynchus mykiss*), sockeye salmon (*Oncorhynchus nerka*), coho salmon (*Oncorhynchus kisutch*), chinook salmon (*Oncorhynchus tshawytscha*), chum salmon (*Oncorhynchus keta*) and pink salmon (*Oncorhynchus gorbuscha*) are supported by the watercourses and their tributaries. Bull Trout, Dolly Varden, Coastal Cutthroat Trout and Westslope Cutthroat Trout are on the Provincial Blue List for endangered species and upper-Skeena coho stocks are of special management concern.

(over)



A large number of the sites were found to occur on S6 streams or non-classified drainages and therefore no fish passage assessments were done on these culverts. For the remaining sites that were classified as fish bearing, the majority were determined to be partial barriers to fish passage with the exception of two full barriers and three crossings which did not present barriers. There were four sites in the Nilkitkwa River watershed which were ranked High priority, the remaining six FPCI sites in the watershed were ranked Moderate priority. Three sites in the Babine River watershed were ranked High priority, three were ranked Moderate priority and six were ranked Low priority. Two of the Low priority sites were not barriers to fish passage.



1.0 INTRODUCTION

Field work for this project commenced July, 2004. All culverts assessed were within the Nilkitkwa River Watershed and the Babine River watershed. Starting at 54 km on the 4000 Road (Nilkitkwa FSR), fish passage-culvert inspections were completed at eligible sites on spur roads off of the Nilkitkwa FSR and on eligible culvert crossing sites on the Nilkitkwa FSR mainline up to ~90 km. Field work for the project continued throughout the summer and into early September with preparation of the report commencing in November of 2004.

This Fish Passage-Culvert Inspection (FPCI) project was implemented to assess fish passage at culvert bearing stream crossings within the Nilkitkwa River Watershed and the Babine River watershed. The assessments were carried out at culvert crossings installed on fish bearing streams on roads primarily constructed prior to the implementation of the Forest Practices Code in 1996. It should be noted that culverts on spur roads that were too overgrown or spur roads that were deactivated were not visited and therefore the culvert sites on possible fish-bearing streams on these roads were not visited or assessed.

Historical inventory information obtained from the “FishWizard” software program, the Fisheries Information Summary System (FISS) and 1:20 000 RIC Reconnaissance Inventory maps have documented the following fish species: Dolly Varden(*Salvelinus malma*), rainbow trout(*Oncorhynchus mykiss*), steelhead(*Oncorhynchus mykiss*), cutthroat trout(*Oncorhynchus clarki*), chinook salmon(*Oncorhynchus tshawytscha*), chum salmon(*Oncorhynchus keta*), coho salmon(*Oncorhynchus kisutch*), pink salmon(*Oncorhynchus gorbuscha*), sockeye salmon(*Oncorhynchus nerka*), lake whitefish(*Coregonus clupeaformis*), mountain whitefish(*Prosopium williamsoni*), lake trout(*Salvelinus namayacush*), burbot(*Lota lota*), kokanee(*Oncorhynchus nerka*), and sucker(*Catostomus spp*).

Insert map

While bull trout (*Salvelinus confluentus*) were not documented in the Nilkitkwa or Babine River by the ‘FishWizard’ software, it is a species which is known to be present in the Nilkitkwa and Babine River watersheds. Bull trout and Dolly Varden are both provincially blue-listed species and are therefore of management concern. Coastal cutthroat trout have also been added to the provincial blue-list as have Westslope cutthroat trout. Upper-Skeena coho stocks are also of special management concern due to dwindling returns in recent years (pers comm. Jeff Lough, 2001). Historically, many of the tributaries to the Nilkitkwa and Babine Rivers were likely important spawning and rearing habitat for coho salmon.

Forest Renewal B.C. implemented its Watershed Restoration Program in 1994. The program, more recently referred to as the Enhancing Environmental Values (EEV) Program, was established to provide an important opportunity to improve water quality and reverse fish habitat impairment as a result of past forest harvesting practices. Although Forest Renewal B.C. closed shop at the end of March 2002, the Land Based Investment Program of the Forest Investment Account provides an avenue for these works to continue. The Babine and Nilkitkwa watersheds are within Pacific Inland Resources’ (PIR) traditional operating area and therefore PIR played the lead role in this project as the proponent.

The completed report includes two electronic copies on CD-ROM (one word document version and another in PDF format) that will be submitted to Pacific Inland Resources Ltd. (a Division of West Fraser Mills, Ltd.). A digital format of the maps will also be submitted to PIR. Three hard copies of the report and maps will also be produced and one each will be submitted to the project proponent (**PIR**), another to the **Ministry of Forests Skeena Stikine District** and the final copy will remain with Silvicon Services Inc. Maps of each watershed accompany the reports and identify the location, degree of barrier and the priority ranking of each fully assessed culvert crossing and also identify sites that were visited but not assessed for fish passage. Sites that were visited but not assessed either were found not to have a defined stream channel associated with the

crossing or were classified as non-fish bearing streams following stream surveys and sampling.

2.0 METHODOLOGY

The methods outlined in WRTC No. 11 were followed to carry out all pre-field and field work for the project with the following exception. Initially, prioritisation of the assessed sites began using the original FPCI scoring matrix (Parker, 2000), however many sites scored the same, making it difficult to rank the sites. Modifications were made to some of the categories within the scoring matrix so that there was increased differentiation between total scores (Saimoto, 2000). The points system for the “% Stream Barred” and “Limiting to Upstream Barrier” categories remained the same. For the remaining categories; Fish Species, Habitat Values, Barriers, Length of New Habitat, criteria and scoring changes were made are as follows:

2.1 FISH SPECIES

Single Species: 6 points for any FPC listed species.

Significant Species: 10 points each for Coastal Cutthroat Trout (*Oncorhynchus clarki clarki*), Dolly Varden (*Salvelinus malma*) and/or Bull Trout (*Salvelinus confluentus*), all provincial blue-listed species.
10 points for Upper-Skeena coho, a race of special management concern (pers. comm. Jeff Lough, 2001).

Multiple Species: 8-10 points based upon significance of species encountered.

2.2 HABITAT VALUES

Scores for habitat values were determined after considering the different habitat variables and comparing the variables between sites. Variables that figured in the scoring process included amount of spawning habitat, amount of over-wintering habitat, stream bed material, channel width, previous or current fish use, fish presence/absence, and the

particular fish species present. The points system separated habitat values into high, moderate, or low categories:

0-3 points: Low habitat value designation

4-7 points: Moderate habitat value designation

8-10 points: High habitat value designation

2.3 BARRIERS

For the barrier category, points were assigned based on field observations and data recorded in the appropriate section of the FPCI Form A. **Undetermined** barriers were scored 1-3 points.

Partial barriers were scored 4-7 points depending upon the degree of obstruction to fish passage. Some of the parameters taken into account included culvert outflow drop and/or minimum pool depth required vs. jumping abilities of target fish species of various life stages, culvert slope and culvert water velocities vs. swimming capabilities of target fish species of various life stages, seasonal high/low flows (i.e. culvert outflow drop at periods of low flow or water velocity barrier at periods of high flow).

Full barriers were scored 8-10 points depending upon the degree of certainty that a particular culvert would act as a barrier to fish passage during periods of either high or low flow.

2.4 LENGTH OF NEW HABITAT

The points scoring system for the Length of New Habitat category was refined and an increase of 1 point per 500 meters of habitat gained was implemented:

>4 km or lake:	10 points	1.5 – 2.0 km:	5 points
3.5 – 4.0 km:	9 points	1.0 – 1.5 km:	4 points
3.0 – 3.5 km:	8 points	0.5 – 1.0 km:	3 points
2.5 – 3.0 km:	7 points	<500 meters:	2 points
2.0 – 2.5 km:	6 points		

2.5 MAPPING SYMBOLS

Mapping symbols were modified so they would show both the type of barrier (full, partial, none and undetermined) and the priority ranking. The site number was moved outside the coloured culvert symbol and the priority ranking was inserted in its place. Also, the colour for the partial barrier symbol was changed from black to yellow. This was done primarily so it would be more conspicuous on the maps and the priority ranking would be visible.

2.6 WATER VELOCITY MEASUREMENTS

To measure water velocity in the streams and in the culverts a water velocity meter was used. The velocity meter had a 2.5 cm diameter impeller which was quite sensitive to low flows and would record velocities down to 0.1 m/s even if not completely submerged. There were still situations however, where there was not enough water for the meter to record a velocity. Where the water velocity was too low for the metre to read or where the water level was too low for the impeller, a measurement of <.1 m/s was given.

3.0 FINDINGS

Findings of the Fish Passage-Culvert Inspections have been summarised by watershed and the priority ranking within each watershed. Forms A, B, C, and D are contained in an appendix for each watershed.

3.1 NILKITKWA RIVER WATERSHED

Located in the far north of the Bulkley TSA and within PIR's operating area, the Nilkitkwa River watershed has its headwaters along the north boundary of the Bulkley TSA. The Nilkitkwa River has a stream length of 83.7 km from its headwaters to its confluence with the Babine River. The main access for the portion of this watershed within PIRs operating area is provided by the Nilkitkwa FSR (4000 Rd) which branches from the Babine Lake road approximately 53 km from Smithers. The Nilkitkwa River watershed contains generally low lying to rolling terrain, growing steeper and mountainous to the east as the watershed approaches the Bait Range. The Nilkitkwa River watershed is a sixth order watershed.

For ease of reference, the information from the data collected at the assessed sites have been summarised based on their priority rank (Table 1). This table acts as a prioritisation summary for FPCI full culvert assessments for the Nilkitkwa River watershed. Scores are based on a modified version of the FPCI scoring matrix as discussed in the previous section. All culverts are sorted by their priority ranking.

Nilkitkwa River Watershed, Summary Table 1.

Prioritisation summary of the FPCI's in the Nilkitkwa River Watershed. Scores based on modified version of FPCI scoring matrix. All culverts sorted by rank.

Rank	Road	Site	Stream Width (m)	Fish Species	Habitat Value	Barrier	Barrier Description	Length of New Habitat	% Stream Barred	Limiting to upstream barrier	Total Score	Priority/ Ranking 39-55: High 26-38: Moderate 15-25: Low
1	481	17	2.24	DV/ BT	H	Partial	Velocity and Undersized Culvert	2800 m	90%	Yes	49	H
2	486	90	.74	DV/RB	M	Partial	Outlet drop	3200 m	59%	No	42	H
3	481	8	2.14	DV/ BT	H	Partial	Velocity and Outlet Drop	1200 m	86%	No	41	H
4	480	1720	.82	DV/ BT	M	Partial	Velocity and Outlet Drop	1800 m	88%	No	39	H
5	4000	607	3.67	DV	10	Partial	Velocity for juveniles	1400	78%	No	38	M
6	481-03	2	1.38	DV/ BT	H	Partial	Outlet Drop Culvert Water Depth	1800 m	60%	No	36	M
7	4000	588	.87	RB	M	Partial	Outlet Drop/ Broken Culvert	<500 m	86%	No	30	M
8	471	1	1.60	RB	M	Full	Velocity	1400 m	58%	No	29	M
9	480	1666	1.12	DV/ BT	L	Full	Velocity and Outlet Drop	200 m	40%	No	28	M
10	486	98	1.16	DV/ BT	M	Partial	Undersized pipe	400 m	40%	No	27	M

4000 Road

Only two FPCI assessments were conducted on the 4000 road within the Nilkitkwa River watershed. Additional sites were visited but not assessed and have been summarised in "Form D – Sites not Assessed Summary Table" in Appendix 1. Site 588 contains a hanging, broken culvert restricting fish access to upstream habitat. The culvert is broken 2 metres above the outlet and the water drops through the culvert and travels underneath the culvert to the outlet pool. Rainbow trout were captured d/s of the crossing. Site 607 was revisited in 2004 to measure culvert water velocity which was accidentally not recorded for this site during the FPCI assessment in 2003.

471 Road

One site on the 471 road underwent a full FPCI assessment. Site 471-1 was determined to be a full barrier and was ranked seventh out of ten with a moderate priority for fish

passage rehabilitation. Site 471-1 also contains a damaged culvert, where the water runs through the broken pipe approximately 2.5 metres upstream from the outlet pool.

480 Road

Two sites on the 480 road underwent full FPCI assessments. Site 1666 was determined to be a full barrier and was ranked eighth out of ten with a moderate priority for fish passage rehabilitation. There is only an estimated 200m of marginal habitat upstream of the culvert. At site 1720 a Dolly Varden was electrofished downstream of the crossing. The undersized culvert and culvert gradient create excessive water velocity within the pipe, and scour at the outlet pool has left the culvert hanging above the streambed. All other sites visited on the 480 road have been summarised in “Form D – Sites not Assessed Summary Table” in Appendix 1.

481 Road

This road is a major spur road of the 480 Road. Two crossings were inspected on the 481 road and both ranked high for remediation. All other sites visited on the 481 road have been summarised in “Form D – Sites not Assessed Summary Table” in Appendix 1. The culvert at Site 481-17 is a partial barrier and scored the highest of all culverts assessed in 2004. This culvert is located on an S3 stream containing a resident population of bull trout/ Dolly Varden and the culvert isolates 90% of the stream length. The culvert at Site 481-08 is a partial barrier due to the high water velocity and outflow drop. It ranked third highest in the Nilkitkwa River watershed due to the presence of Dolly Varden/ bull trout and the fact that 86% of the stream is barred to some life stages of fish because the culvert is a partial barrier which restricts fish migration upstream.

481-03 Road

The only site on the 481-03 road to receive a FPCI was site 2, which is the same stream as 480-17. While habitat upstream of the culvert was marginal, Dolly Varden were captured at the outlet pool below the culvert. This site was ranked moderate due to the

low quality of upstream fish habitat. The only other culvert on this road, site 486-03-01, is summarised in “Form D – Sites not Assessed Summary Table” in Appendix 1.

486 Road

Two sites were inspected on the 486 Road. All other sites visited on the 486 road have been summarised in “Form D – Sites not Assessed Summary Table” in Appendix 1. Dolly Varden/ bull trout were observed at both sites on the 486 road. The culvert at Site 90 is a partial barrier and ranks second in the Nilkitkwa watershed due to the length of habitat upstream of the barrier. Site 486-98 only ranked moderate due to the low quality of habitat located upstream of the road crossing.

3.2 BABINE RIVER WATERSHED

Located in the north of the Bulkley TSA and within PIR’s operating area, the Babine River has a stream length of 100.8 km from it’s headwaters to its confluence with the Skeena River. The main access for the portion of this watershed within PIRs operating area is provided by the Nilkitkwa FSR (4000 Rd) which branches from the Babine Lake road approximately 52.5km from Smithers. The Babine River watershed contains generally flat to rolling terrain with some broken ground, growing steeper and mountainous to the northwest as the river approaches its confluence with the Skeena River. The Babine River watershed is a seventh order watershed and is by far the predominant sockeye producer in the Skeena River watershed.

For ease of reference, the information from the data collected at the assessed sites have been summarised based on their priority rank (Table 1). This table acts as a prioritisation summary for FPCI full culvert assessments for the Babine River watershed. Scores are based on a modified version of the FPCI scoring matrix as discussed in the previous section. All culverts are sorted by their priority ranking.

Babine River Watershed, Summary Table 1.

Prioritisation summary of the FPCI's in the Babine River Watershed. Scores based on modified version of FPCI scoring matrix. All culverts sorted by rank.

Rank	Road	Site	Stream Width (m)	Fish Species	Habitat Value	Barrier	Barrier Description	Length of New Habitat	% Stream Barred	Limiting to upstream barrier	Total Score	Priority/ Ranking 39-55: High 26-38: Moderate 15-25: Low
1	457	14	2.19	RB	H	Partial	Water Velocity and Undersized Culvert	9000 m	82%	No	41	H
2	456	40	2.15	DV/ BT	H	Partial	Water Velocity and Outfall Drop	2500 m	57%	No	40	H
3	457	6	2.20	RB/ DV?	H	Partial	Outfall Drop and Undersized Culvert	4800 m	65%	No	39	H
4	454A	4	1.06	DV/ BT	M	Partial	Outfall Drop and Water Velocity	850 m	89%	No	37	M
5	454B	9	1.77	RB	H	Partial	Water Velocity and Undersized Culvert	2200 m	40%	No	36	M
6	465	31	3.15	RB	H	None	Undersized Pipe	5600 m	56%	No	28	M
7	457F	4	1.02	RB	L	Partial	Undersized Culvert/ Outfall Drop	1000 m	50%	Yes	25	L
8	457	28	1.08	RB	L	Partial	Velocity and Undersized Culvert	900 m	60%	No	24	L
9	457	74	1.22	RB	M	Partial	Outfall Drop	500 m	40%	No	20	L
10	454B	11	.92	RB	L	Partial	Undersized Culvert and Outlet drop	600 m	15%	No	19	L
11	457	48	1.48	RB	M	None	None	300 m	0	No	0	L
12	630-4	10	.74	RB	M	None	None	250 m	0	No	0	L

454A Road

One site on the 454A road underwent a full FPCI assessment. This site, Site 454A-4, was determined to be a partial barrier due to a hanging culvert and was ranked fifth out of eleven in the Babine River watershed with a moderate priority for fish passage rehabilitation. Dolly Varden/ bull trout were trapped directly downstream of the culvert. No other culverts received FPCI's on the 454A road. All other sites visited on the 454A road have been summarised in "Form D – Sites not Assessed Summary Table" in Appendix 1.

454B Road

Full FPCI assessments were conducted at two sites on the 454B Road. All other sites visited on the 454B road have been summarised in “Form D – Sites not Assessed Summary Table” in Appendix 1. The first crossing, 454B-11 is a partial barrier due to the culvert size and outlet drop. It received a low priority ranking due to the poor fish habitat upstream of the crossing. The second crossing on the 454B road is site 9. This site contains a partial barrier caused by an undersized culvert and potential for high water velocities during spring freshet. Site 11 ranked high priority due to the good quality of habitat and it is lake headed.

456 Road

Only Site 40 was identified on the 456 road to require an FPCI. This site contained a partial barrier created by high water velocity in the culvert and an excessive outfall drop. Due in part to the good fish habitat upstream, Site 40 ranks high as a remediation priority. Triton Site R25 on the 1:20,000 Inventory maps indicate Dolly Varden within this stream. All other sites visited have been summarised in “Form D – Sites not Assessed Summary Table” in Appendix 1.

457 Road

The 457 road contains five crossings on which full FPCI's were conducted. All other sites visited on the 457 road have been summarised in “Form D – Sites not Assessed Summary Table” in Appendix 1. Four of the five FPCI's conducted revealed partial barriers and one was determined to be no barrier at all. Three of the five sites contained extremely undersized culverts. Sites 6 and 14 ranked high on the priority rating, while sites 28, 48, and 74 ranked low. Quality of fish habitat and ‘% Stream Barred’ played strong roles in ranking these 3 low priority crossings.

457-A Road to 457-E Road

These five roads have all been deactivated and contain no crossing structures along their lengths.

457-F Road

This road contains one stream crossing at site 4 which is the same stream as crossing site 457-74. Despite eventually flowing into Twin Lakes this stream ranked low mainly due to poor fish habitat. All other sites visited on the 457 road have been summarised in “Form D – Sites not Assessed Summary Table” in Appendix 1.

465 Road

Only one crossing on the 465 road required a full FPCI to be conducted. Site 31 contains no evident barriers to fish travel through the existing pipe, but due to an undersized pipe it is expected water velocities will greatly increase during high water periods. All other sites visited on the 465 road have been summarised in “Form D – Sites not Assessed Summary Table” in Appendix 1.

630-4 Spur

Only site 10 underwent full FPCI assessment on the 630-4 Spur road within the Babine River watershed. Additional sites were done in the fall of 2003 and appear in the Fish Passage Culvert Inspections 2003 Report. Site 10 was determined to contain no barriers to fish passage and received a low priority for replacement. All other sites visited on the 485 road have been summarised in “Form D – Sites not Assessed Summary Table” in Appendix 1.

4.0 SUMMATION

Rankings of high were given to seven sites within the portions of the Nilkitkwa River and Babine River watersheds in which the Fish Passage-Culvert Inspections were conducted in 2004. The remaining sites assessed were ranked as either moderate or low priority. The majority of the sites assessed were determined to be partial barriers except two crossings which contained full barriers; both ranked moderate. Three sites contained no barriers at the crossing, one of which ranked moderate priority and two of which ranked low.

The seven high priority sites are located on the 456 Road, the 457 Road, the 480 Road, the 481 Road and the 486 Road. These sites are all partial barriers but ranked high due to the fish species present, the amount of habitat upstream of the road crossings, the habitat value, and in the case of Site 481-17 it is limiting access to another culvert barrier upstream. Future in-stream fish passage rehabilitation work based on the findings of this report will be targeted primarily at those sites ranking high in priority, although fish passage issues at some of the moderate priority sites should be addressed if there is a budget for the work and significant lengths of new, good quality habitat can be gained.

5.0 LITERATURE CITED

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6.0 APPENDICES

TAB 1 APPENDIX 1 – NILKITKWA RIVER WATERSHED

Table 2. Summary of Sampling Effort and Results
Form A with Photo pages
Form B
Form C
Form D

Table 2. Summary of Sampling Effort and Results – Nilkitkwa River watershed

Site Number	Method/ No.	1:20,000 K Mapping?	Previous Stream Classification	Stream Classification	Fish Presence/ Species	Comments
4000 Road						
588	EF	No	Not Classified	S4	RB	
589	EF	No	Not Classified	S6	NFC	
612	MT	Yes	Inferred Fish	S6	NFC	
617	EF	Yes	Inferred S4	S6	NFC	
618	EF	Yes	Inferred S3	S6	NFC	
628	EF	Yes	Inferred S4	S6	NFC	
771	MT/ EF	Yes	Inferred S3	S6	NFC	Minnow Traps set upstream in the lake 02161BABR.
780	MT	No	Not Classified	S6	NFC	MT sampled in 2003.
477D Road						
11	EF	Yes	Inferred S4	S6	NFC	
14	EF	Yes	Inferred S4	S6	NFC	
24	EF	Yes	Inferred Fish	S6	NFC	
477I Road						
3	EF	No	Unclassified	S6	NFC	
480 Road						
17 km	EF	Yes	Inferred S3	Not Classified	DV/ BT	Sampled to determine fish presence for site 1720.
1620	EF	Yes	Inferred Fish	S6	NFC	
1666	EF	Yes	Inferred Fish	S4	NFC	
1669	3MT	Yes	Inferred S3	S6	NFC	
1720	EF	Yes	Inferred Fish	S4	DV	
481 Road						
8	MT	Yes	Inferred Fish	S3	DV/ BT	
17	MT/ EF	Yes	Inferred S4	S3	DV/ BT	
481-03 Road						
2	MT	Yes	Inferred S4	S4	DV/ BT	
486 Road						
90	VO	Yes	Inferred Fish	S4	DV/ BT	Fish observed u/s and d/s of crossing.
98	MT/ VO	Yes	No Visible Channel	S4	DV/ BT	Fish observed 0+515 m d/s.
101	2MT/ EF	Yes	No Visible Channel	S6	NFC	
103	2MT	Yes	Inferred S3	S6	NFC	
108	2MT	Yes	Inferred S3	NCD	NFC	NCD above road/ Stream below rd.

Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	08/18/04	Stream Name	Unnamed
Road name/ID #	4000 Road	Road Location (MoF District)	Skeena /Stikine
UTM/GPS Location	E 649849 / N 6153848	Watershed Code	480-360200-
1:20 000 Map Sheet	093M.057	Recorder's Name	REK
Site Number	Feature 588		

Culvert

Culvert damaged at outlet. Flow drops through pipe approximately 2 m inside pipe from outlet and runs underneath pipe to outlet pool

Characteristics:

Culvert Diameter (mm)	460	Culvert Elev. (m)	U/s	2.32	D/s	3.08	Slope (%)	3.4
Culvert Length (m)	10.5	High Water Mark (cm)	28 inlet/13 outlet					
Culvert Material	Steel	Culvert Water Depth (cm)	6 inlet/ 0 outlet					
Culvert Water Velocity (m/sec)	<0.1	0.3	-	-	Culvert Outfall Drop (cm)	7		
Culvert Shape	Round	Culvert Inflow Drop (cm)	0					
Culvert Embedded (yes/no)	No	Depth Embedded	Inlet (cm)	Flush	Outlet (cm)	-		
Culvert Wetted Width (cm)	30 inlet	Culvert Maintenance (Hi/Mod/L/No)	L					
Coefficient of Roughness	.015	Fill Slope Depth (m)	U/S	0.32	D/S	0.50		

Stream

Stream flows into known fish bearing stream. Stream runs down ditchline at inlet and outlet for approximately 15 m on either side. Stream crosses ribboned "Cultural Heritage Resource" trail.

Characteristics:

Stream Reach	4	Stream Classification	S4				
Pool Depth at Outfall (cm)	20	S1 S2 S3 S4 S5 S6 P					
Sediment Source/Degree	Road runoff/low to mod	Blue Listed / Significant Spp.					
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	1.3	0.80	0.40	0.55	1.15	1.00	.87
Bankfull Width (m)	1.3	0.95	4.40	0.55	1.25	1.00	.91
Water Depth (cm) .25 of width	6	4	2	9	13	21	9
Water Depth (cm) .5 of width	4	4	4	8	12	15	8
Water Depth (cm) .75 of width	5	7	1	17	7	8	8
Bankfull Depth (cm)	10	17	12	23	32	28	20
Stream Water Velocity (m/sec)	<0.1	0.1	0.4	<0.1	<0.1	<0.1	<.1
Average Stream Gradient (%)	4			6			5
Maximum Stream Gradient (%)	4			7			5.5
Length of Maximum Grade (m)	25			5			N/A
Coefficient of Roughness	0.060			0.060			N/A
Fish Presence - yes, no, no survey	Yes, Silvicon			No survey			N/A
Fish Sampling Method	EF			-			N/A
Sampling Effort (time)	238			-			N/A
Species Present	RB (2)			-			N/A
Beaver Activity/Type	None			None			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial
Barrier Type:	Outfall Drop/ Broken Culvert

Site Photos:

Roll #:	DB2	Inlet downstream photo:	2
Inlet upstream photo:	1	Outlet downstream photo:	3
Outlet upstream photo:	4		

Site 4000-588
Form A – Fish Passage – Culvert Inspection – Side 2

Comments:
 +40% Grade for 5-7 m on escarpment into know fish bearing stream. Also several drops, first one has 45 cm drop into 25 cm pool. At peak flows the pool is approx. 20 cm deeper; therefore, 25 cm drop to 45 cm pool. Poor staging on 40% gradient. Boulders and cobbles prevent formation of plunge pools and create very poor staging for jumps. It is difficult to believe that shocked RB migrated up from know fish bearing stream. It may be possible that they have seeded from the top down.

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	900	Stream Length Above Barrier (m)	Est. <500 m
Road Responsibility		% Stream Barred	86

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant		H		Full		≥ 1 km		> 70%	10	Yes	
Single	6	M	5	Partial	7	< 1 km ≥ 500 m		≥50-70%		No	0
Other		L		Undeter		< 500 m	2	< 50%			

Total Score: 30



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	10/17/03	Stream Name	Unnamed
Road name/ID #	4000 Road	Road Location (MoF District)	Skeena-Stikine
UTM/GPS Location	E 651260 / N 6158148	Watershed Code	480-360200-20500-14300
1:20 000 Map Sheet	093M.057	Recorder's Name	DB / RK
Site Number	Feature 607		

Culvert

Back watered 50%

Characteristics:

Culvert Diameter (mm)	2400	Culvert Elev. (m)	U/s	4.6	D/s	4.76	Slope (%)	0.9%
Culvert Length (m)	17	High Water Mark (cm)	47 out / 29 in					
Culvert Material	Metal	Culvert Water Depth (cm)	31 out / 12 in					
Culvert Water Velocity (m/sec)	1.0	0.9	0.3	0.4	Culvert Outfall Drop (cm)	0 flush		
Culvert Shape	Circular	Culvert Inflow Drop (cm)	0 flush					
Culvert Embedded (yes/no)	No	Depth Embedded	Inlet (cm)	-	Outlet (cm)	-		
Culvert Wetted Width (cm)	155 out/ 107 in	Culvert Maintenance (Hi/Mod/L/No)	L					
Coefficient of Roughness	0.021	Fill Slope Depth (m)	U/S	0.2	D/S	0.6		

Stream

Riffle pool morph. Abundant LWD and deep pools. Alder over vegetation is abundant.

Characteristics:

Stream Reach	1	Stream Classification	S3				
Pool Depth at Outfall (cm)	0	S1 S2 S3 S4 S5 S6 P					
Sediment Source/Degree	Low – Ditch water	Blue Listed / Significant Spp.	DV				
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	3.0	3.60	3.50	3.60	2.77	3.7	3.36 m
Bankfull Width (m)	3.75	3.60	3.50	3.60	3.15	4.40	3.67 m
Water Depth (cm) .25 of width	6	22	13	22	22	20	18 cm
Water Depth (cm) .5 of width	23	20	43	25	32	26	28 cm
Water Depth (cm) .75 of width	53	18	37	5	17	17	25 cm
Bankfull Depth (cm)	70	47	53	33	55	48	51 cm
Stream Water Velocity (m/sec)	.15	.40	.20	.30	.70	.30	0.34 m/s
Average Stream Gradient (%)	3			4			3.5%
Maximum Stream Gradient (%)	-			7			7%
Length of Maximum Grade (m)	-			20			N/A
Coefficient of Roughness	Gravel/Fines 0.040			Gravel/Fines 0.040			N/A
Fish Presence - yes, no, no survey	Yes			Yes			N/A
Fish Sampling Method	Triton 1:20 K Inv.			Triton 1:20 K Inv.			N/A
Sampling Effort (time)	-			-			N/A
Species Present	DV			DV			N/A
Beaver Activity/Type	None			None			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial. Culvert water velocities are barrier to juvenile fish.
Barrier Type:	Culvert slope is <1% (0.9%). No inlet or outlet drops. Culvert water velocity is a barrier to juveniles because it exceeds 0.5 m/s (0.65m/s avg. velocity measured at low flows during August 2004).

Site Photos:

Roll #:	REK 16		
Inlet upstream photo:	6	Inlet downstream photo:	7
Outlet upstream photo:	9	Outlet downstream photo:	10
Inside culvert (upstream)	8		



**Site 4000-607
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments:
Q100 Dia. Est. indicates existing 2400 mm CMP is slightly undersized. Back-watering the outlet could be a quick remedy to reduce water velocities within the culvert.

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	2700	Stream Length Above Barrier (m)	1400
Road Responsibility		% Stream Barred	77.8%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant	10 DV	H	10	Full		≥ 1 km	4	> 70%	10	Yes	
Single		M		Partial	4	< 1 km ≥ 500 m		≥50-70%		No	0
Other		L		Undeter		< 500 m		< 50%			

Total Score: 38



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	07/20/04	Stream Name	Unnamed
Road name/ID #	471 Road	Road Location (MoF District)	Skeena /Stikine
UTM/GPS Location	E 651317 / N 6155962	Watershed Code	480-360200-
1:20 000 Map Sheet	93M057/ 058	Recorder's Name	DB/RK
Site Number	Feature 471-1		

Culvert

Culvert undersized. Culvert is bent and broken inside so the water drops through the pipe and flows beneath for ~2 m before entering the outlet pool.

Characteristics:

Culvert Diameter (mm)	750	Culvert Elev. (m)	U/s	2.16	D/s	3.45	Slope (%)	12.3
Culvert Length (m)	10.5		High Water Mark (cm)		22 out / 22 in			
Culvert Material	Metal		Culvert Water Depth (cm)		0 out / 1 in			
Culvert Water Velocity (m/sec)	>.1	Out	.2	In	Culvert Outfall Drop (cm)		3	
Culvert Shape	Circular		Culvert Inflow Drop (cm)		0			
Culvert Embedded (yes/no)	No	Depth Embedded	Inlet (cm)	-	Outlet (cm)	-		
Culvert Wetted Width (cm)	0 out / 13 in		Culvert Maintenance (Hi/Mod/L/No)					
Coefficient of Roughness	.018	Fill Slope Depth (m)	U/S	0.9	D/S	1.49		

Stream

Stream flows through an old burn. Multiple small drops in the channel as it travels to Starvation Lake. No barriers observed. Defaulted to S4. Starvation Lake contains RB, LSU, L and KO. Stream water level is very low. Substrates are sub-angular.

Characteristics:

Stream Reach	1		Stream Classification		S3		
Pool Depth at Outfall (cm)	3		S1 S2 S3 S4 S5 S6 P				
Sediment Source/Degree	Low – road runoff		Blue Listed / Significant Spp.				
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	0.60	0.65	0.70	1.63	0.90	0.85	0.89
Bankfull Width (m)	1.60	1.40	1.75	1.86	1.60	1.40	1.60
Water Depth (cm) .25 of width	3	1	3	1	4	5	3
Water Depth (cm) .5 of width	4	4	0	0	6	3	3
Water Depth (cm) .75 of width	0	0	3	2	5	0	2
Bankfull Depth (cm)	14	40	35	20	22	26	26
Stream Water Velocity (m/sec)	<.1	<.1	.10	<.1	<.1	<.1	<.1
Average Stream Gradient (%)	7			8			7.5
Maximum Stream Gradient (%)	8			13			10.5
Length of Maximum Grade (m)	-			10			N/A
Coefficient of Roughness	.04			.04			N/A
Fish Presence - yes, no, no survey	No survey			No survey			N/A
Fish Sampling Method	-			-			N/A
Sampling Effort (time)	-			-			N/A
Species Present	-			-			N/A
Beaver Activity/Type	Yes – clippings			-			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Full
Barrier Type:	Velocity during higher flows/ gradient of pipe.

Site Photos:

Roll #:	DB		
Inlet upstream photo:	7	Inlet downstream photo:	8
Outlet upstream photo:	6	Outlet downstream photo:	5

**Site 471-1
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments:

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	1200	Stream Length Above Barrier (m)	1400 m
Road Responsibility		% Stream Barred	58%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant		H		Full	8	≥ 1 km	4	> 70%		Yes	
Single	6	M	5	Partial		< 1 km ≥ 500 m		≥50-70%	6	No	0
Other		L		Undeter		< 500 m		< 50%			

Total Score: 29



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	08/02/04	Stream Name	Unnamed
Road name/ID #	480 Road	Road Location (MoF District)	Skeena /Stikine
UTM/GPS Location	E 641806 / N 6172261	Watershed Code	480-360200-
1:20 000 Map Sheet	093M.067	Recorder's Name	DB/RK
Site Number	1666		

Culvert

The culvert has a high gradient and is very long with an outlet drop of 26 cm. Water velocity will increase greatly with a high volume of water in the spring.

Characteristics:

Culvert Diameter (mm)	800	Culvert Elev. (m)	U/s	1.0	D/s	3.93	Slope (%)	16.7
Culvert Length (m)	17.5		High Water Mark (cm)		15 in / 15 out			
Culvert Material	Metal		Culvert Water Depth (cm)		2 in / 2 out			
Culvert Water Velocity (m/sec)	.3	In	.6	out	Culvert Outfall Drop (cm)		26	
Culvert Shape	Circular		Culvert Inflow Drop (cm)		2			
Culvert Embedded (yes/no)	Yes	Depth Embedded	Inlet (cm)	.2	Outlet (cm)			
Culvert Wetted Width (cm)	23 in / 21 out		Culvert Maintenance (Hi/Mod/L/No)		Mod			
Coefficient of Roughness	.018	Fill Slope Depth (m)	U/S	0.1	D/S	2.51		

Stream

The stream spreads out into multiple channels downstream of the road. The main channel enters a fish bearing (lake headed) stream prior to entering the Nilkitkwa River.

Characteristics:

Stream Reach	1		Stream Classification		Default S4		
Pool Depth at Outfall (cm)	23		S1 S2 S3 S4 S5 S6 P				
Sediment Source/Degree	Low		Blue Listed / Significant Spp.		DV d/s in Nilkitkwa R		
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	1.00	0.65	0.95	1.15	0.85	0.66	0.88
Bankfull Width (m)	1.45	1.20	0.65	1.30	1.05	1.06	1.12
Water Depth (cm) .25 of width	2	2	1	0	4	5	2
Water Depth (cm) .5 of width	1	7	1	2	7	2	3
Water Depth (cm) .75 of width	1	0	1	2	3	0	1
Bankfull Depth (cm)	15	18	11	12	25	22	17
Stream Water Velocity (m/sec)	<.1	0.1	0.1	0.1	0.3	0.1	.1
Average Stream Gradient (%)	11			13, 18			14
Maximum Stream Gradient (%)	20			30			25
Length of Maximum Grade (m)	5			5			N/A
Coefficient of Roughness	.04			.04			N/A
Fish Presence - yes, no, no survey	No survey			No survey			N/A
Fish Sampling Method	-			-			N/A
Sampling Effort (time)	-			-			N/A
Species Present	-			-			N/A
Beaver Activity/Type	no			no			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Full
Barrier Type:	Velocity and outfall drop. Gradient 16.7%

Site Photos:

Roll #:	REK 12	Inlet downstream photo:	5
Inlet upstream photo:	4	Outlet downstream photo:	6
Outlet upstream photo:	7		

**Site 480-1666
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments:

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	900	Stream Length Above Barrier (m)	200 m
Road Responsibility		% Stream Barred	40%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant	10	H		Full	10	≥ 1 km		> 70%		Yes	
Single		M		Partial		< 1 km ≥ 500 m		≥50-70%		No	0
Other		L	3	Undeter		< 500 m	2	< 50%	3		

Total Score: 28



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	08/26/04	Stream Name	Unnamed
Road name/ID #	480 Road	Road Location (MoF District)	Skeena / Stikine
UTM/GPS Location	E 639084 / N 6177276	Watershed Code	480-360200-
1:20 000 Map Sheet	093.M077	Recorder's Name	REK
Site Number	1720		

Culvert

Culvert fairly long. Gradient is 4.7 %, has a minor kink on side near centre where joined to second section of pipe.

Characteristics:

Culvert Diameter (mm)	600	Culvert Elev. (m)	U/s	3.20	D/s	4.00	Slope (%)	4.7
Culvert Length (m)	17	High Water Mark (cm)	10 in / 9 out					
Culvert Material	Steel	Culvert Water Depth (cm)	3 in / 4 out					
Culvert Water Velocity (m/sec)	0.5	0.4	0.4	-	Culvert Outfall Drop (cm)	29		
Culvert Shape	Round	Culvert Inflow Drop (cm)	0 – flush					
Culvert Embedded (yes/no)	No	Depth Embedded	Inlet (cm)	0	Outlet (cm)	0		
Culvert Wetted Width (cm)	29 in / 31 out	Culvert Maintenance (Hi/Mod/L/No)	No					
Coefficient of Roughness	.018	Fill Slope Depth (m)	U/S	2.27	D/S	3.05		

Stream

Stream channel is often intermittently underground, covered by soil and vegetation mats, but there is a continuous channel to the confluence with 17 km Bridge Stream.

Characteristics:

Stream Reach	1	Stream Classification	S4				
Pool Depth at Outfall (cm)	10	S1 S2 S3 S4 S5 S6 P					
Sediment Source/Degree	Road and ditch runoff	Blue Listed / Significant Spp.	DV/BT				
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	0.70	0.75	0.70	0.60	0.50	0.70	0.66
Bankfull Width (m)	0.95	0.75	1.10	0.60	0.80	0.70	0.82
Water Depth (cm) .25 of width	10	1	3	6	0	8	5
Water Depth (cm) .5 of width	8	7	8	2	1	6	5
Water Depth (cm) .75 of width	1	4	7	4	6	7	5
Bankfull Depth (cm)	18	20	26	20	20	16	20
Stream Water Velocity (m/sec)	.1	0.3	<.1	<.1	<.1	<.1	.1
Average Stream Gradient (%)	6, 7			4, 3			3.3
Maximum Stream Gradient (%)	8			4			6
Length of Maximum Grade (m)	5			20			N/A
Coefficient of Roughness	.04			.04			N/A
Fish Presence - yes, no, no survey	Yes			No survey			N/A
Fish Sampling Method	EF			-			N/A
Sampling Effort (time)	8 sec			-			N/A
Species Present	DV / BT			-			N/A
Beaver Activity/Type	No			no			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial
Barrier Type:	Culvert Slope, outfall drop

Site Photos:

Roll #:	REK 12	Inlet upstream photo:	10	Inlet downstream photo:	11
Outlet upstream photo:	8	Outlet downstream photo:	9		

480-1720
Form A – Fish Passage – Culvert Inspection – Side 2 Site

Comments:

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	800	Stream Length Above Barrier (m)	1800 m
Road Responsibility		% Stream Barred	88%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant	10	H		Full		≥ 1 km	5	> 70%	10	Yes	
Single		M	7	Partial	7	< 1 km ≥ 500 m		≥50-70%		No	0
Other		L		Undeter		< 500 m		< 50%			

Total Score: 39



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	08/18/04	Stream Name	Unnamed
Road name/ID #	481 Road	Road Location (MoF District)	Skeena/Stikine
UTM/GPS Location	E 647110 / N 6164304	Watershed Code	480-360200-
1:20 000 Map Sheet	093.M057/ 067	Recorder's Name	REK, DB
Site Number	8		

Culvert

High water velocity.

Characteristics:

Culvert Diameter (mm)	1200	Culvert Elev. (m)	U/s	2.86	D/s	3.41	Slope (%)	5.2
Culvert Length (m)	10.5		High Water Mark (cm)		18 out / 24 in			
Culvert Material	Metal		Culvert Water Depth (cm)		4 out / 5 in			
Culvert Water Velocity (m/sec)	1.2	out	0.9	In	Culvert Outfall Drop (cm)		3	
Culvert Shape	Circular		Culvert Inflow Drop (cm)		0			
Culvert Embedded (yes/no)	No	Depth Embedded	Inlet (cm)	-	Outlet (cm)	-		
Culvert Wetted Width (cm)	46 out / 49 in		Culvert Maintenance (Hi/Mod/L/No)		Low			
Coefficient of Roughness	.02	Fill Slope Depth (m)	U/S	0.78	D/S	1.27		

Stream

Riffle pool morph, few pools, abundant undercut banks and over vegetation.

Characteristics:

Stream Reach	1		Stream Classification		S3		
Pool Depth at Outfall (cm)	44		S1 S2 S3 S4 S5 S6 P				
Sediment Source/Degree	Low		Blue Listed / Significant Spp.		DV/ BT		
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	1.90	2.85	1.00	1.90	0.97	1.65	1.71
Bankfull Width (m)	1.90	1.85	1.88	2.00	3.10	2.12	2.14
Water Depth (cm) .25 of width	4	12	11	9	6	5	7
Water Depth (cm) .5 of width	8	5	4	10	0	6	6
Water Depth (cm) .75 of width	17	3	0	9	0	3	5
Bankfull Depth (cm)	34	23	29	31	30	29	29
Stream Water Velocity (m/sec)	0.2	0.1	0.6	0.3	0.2	0.4	.30
Average Stream Gradient (%)	6			6			6
Maximum Stream Gradient (%)	6			8			<u>7</u>
Length of Maximum Grade (m)	-			-			N/A
Coefficient of Roughness	.04			.04			N/A
Fish Presence - yes, no, no survey	Yes			-			N/A
Fish Sampling Method	EF, MT			-			N/A
Sampling Effort (time)	EF 59 sec, MT overnight			-			N/A
Species Present	DV / BT			-			N/A
Beaver Activity/Type	None			-			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial
Barrier Type:	Velocity

Site Photos:

Roll #:	REK 11		
Inlet upstream photo:	15	Inlet downstream photo:	14
Outlet upstream photo:	17	Outlet downstream photo:	16

Site 481-8
Form A – Fish Passage – Culvert Inspection – Side 2

Comments:

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	1600	Stream Length Above Barrier (m)	1200 m
Road Responsibility		% Stream Barred	86 m

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant	10	H	10	Full		≥ 1 km	4	> 70%	10	Yes	
Single		M		Partial	7	< 1 km ≥ 500 m		≥50-70%		No	0
Other		L		Undeter		< 500 m		< 50%			

Total Score: 41



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	07/20/04	Stream Name	Unnamed
Road name/ID #	481	Road Location (MoF District)	Skeena / Stikine
UTM/GPS Location	E 648606 / N 6163108	Watershed Code	480-360200-24500-
1:20 000 Map Sheet	093M.057	Recorder's Name	DB / REK
Site Number	17 (Same stream as 481-03-02)		

Culvert

Undersized, long pipe

Characteristics:

Culvert Diameter (mm)	800	Culvert Elev. (m)	U/s	5.28	D/s	5.95	Slope (%)	3.7
Culvert Length (m)	18.0		High Water Mark (cm)		25 out / 26 in			
Culvert Material	Metal		Culvert Water Depth (cm)		3 out / 2 in			
Culvert Water Velocity (m/sec)	.3	Out	.4	In	Culvert Outfall Drop (cm)		3	
Culvert Shape	Circular		Culvert Inflow Drop (cm)		0			
Culvert Embedded (yes/no)	No	Depth Embedded	Inlet (cm)	Flush	Outlet (cm)			
Culvert Wetted Width (cm)	30 out / 27 in		Culvert Maintenance (Hi/Mod/L/No)		L			
Coefficient of Roughness	.018	Fill Slope Depth (m)	U/S	2.82	D/S	3.30		

Stream

Riffle pool morph, low gradient stream with high spring freshet flows. Steep gradient downstream of culvert prior to entering Charleston Creek.

Characteristics:

Stream Reach	1		Stream Classification		S3		
Pool Depth at Outfall (cm)	11		S1 S2 S3 S4 S5 S6 P				
Sediment Source/Degree	No		Blue Listed / Significant Spp.		DV/BT		
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	1.05	2.40	1.20	1.00	1.85	1.30	1.78
Bankfull Width (m)	1.65	2.50	2.35	3.65	1.25	1.45	2.24
Water Depth (cm) .25 of width	31	20	0	18	16	31	19
Water Depth (cm) .5 of width	14	14	9	14	17	19	15
Water Depth (cm) .75 of width	6	14	19	0	9	7	9
Bankfull Depth (cm)	31	45	30	25	40	29	33
Stream Water Velocity (m/sec)	.1	<.1	<.1	.1	<.1	.1	.1
Average Stream Gradient (%)	4			3			3.5
Maximum Stream Gradient (%)	40			-			40
Length of Maximum Grade (m)	50			-			N/A
Coefficient of Roughness	.04			.04			N/A
Fish Presence - yes, no, no survey	Yes			No survey			N/A
Fish Sampling Method	EF / MT			-			N/A
Sampling Effort (time)	355			-			N/A
Species Present	DV / BT			-			N/A
Beaver Activity/Type	None			None			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial
Barrier Type:	Water velocity during spring freshet.

Site Photos:

Roll #:	DB2		
Inlet upstream photo:	14	Inlet downstream photo:	15
Outlet upstream photo:	12	Outlet downstream photo:	13

**Site 481-17
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments: Culvert grossly undersized.

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	1500	Stream Length Above Barrier (m)	2800 m
Road Responsibility		% Stream Barred	90%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant	10	H	10	Full		≥ 1 km	7	> 70%	10	Yes	5
Single		M		Partial	7	< 1 km ≥ 500 m		≥50-70%		No	
Other		L		Undeter		< 500 m		< 50%			

Total Score: 49



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	08/25/04	Stream Name	Unnamed
Road name/ID #	481-03	Road Location (MoF District)	Skeena / Stikine
UTM/GPS Location	E 648804 / N 61644011	Watershed Code	480-360200-24500-
1:20 000 Map Sheet	093.M057/ 067	Recorder's Name	DB / RK
Site Number	02		

Culvert

Culvert placed beneath corduroy road.

Characteristics:

Culvert Diameter (mm)	1200	Culvert Elev. (m)	U/s	3.32	D/s	3.13	Slope (%)	1.8
Culvert Length (m)	10.5		High Water Mark (cm)		12 in / 15 out			
Culvert Material	Metal		Culvert Water Depth (cm)		2 in / 1 out			
Culvert Water Velocity (m/sec)	0.1	In	0.2	Out	Culvert Outfall Drop (cm)		5	
Culvert Shape	Circular		Culvert Inflow Drop (cm)		0			
Culvert Embedded (yes/no)	No		Depth Embedded	Inlet (cm)	-		Outlet (cm)	-
Culvert Wetted Width (cm)	26 in / 21 out		Culvert Maintenance (Hi/Mod/L/No)			Low		
Coefficient of Roughness	.02	Fill Slope Depth (m)	U/S	0.30	D/S	0.41		

Stream

Riffle pool morph. BM – Gravel / Fines. Excellent cover provided by over vegetation.

Characteristics:

Stream Reach	2		Stream Classification		S4		
Pool Depth at Outfall (cm)	21		S1 S2 S3 S4 S5 S6 P				
Sediment Source/Degree	Low		Blue Listed / Significant Spp.		DV / BT		
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	1.05	1.20	1.22	0.71	0.98	0.40	0.93
Bankfull Width (m)	1.47	1.42	1.34	1.48	1.60	0.95	1.38
Water Depth (cm) .25 of width	2	0	4	1	4	5	3
Water Depth (cm) .5 of width	1	1	5	0	1	0	1
Water Depth (cm) .75 of width	0	5	4	1	0	0	2
Bankfull Depth (cm)	24	25	24	21	19	38	25
Stream Water Velocity (m/sec)	0.1	0.1	<.1	<.1	<.1	<.1	.1
Average Stream Gradient (%)	5			4			4.5
Maximum Stream Gradient (%)	8			8			8
Length of Maximum Grade (m)	-			-			N/A
Coefficient of Roughness	.040			.040			N/A
Fish Presence - yes, no, no survey	Yes			Unknown			N/A
Fish Sampling Method	1 MT			1 MT			N/A
Sampling Effort (time)	2 hrs			-			N/A
Species Present	DV / BT			-			N/A
Beaver Activity/Type	No			No			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial
Barrier Type:	Outlet drop and minimal water depth in culvert.

Site Photos:

REK 11 #25 DV

Roll #: _____

Inlet upstream photo: _____ Inlet downstream photo: _____

Outlet upstream photo: _____ Outlet downstream photo: _____



**Site 481 03-2
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments:

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	1200	Stream Length Above Barrier (m)	1800 m
Road Responsibility		% Stream Barred	60%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant	10	<u>H</u>	8	<u>Full</u>		≥ 1 km	5	> 70%		Yes	
Single		M		Partial	7	< 1 km ≥ 500 m		≥50-70%	6	No	0
Other		L		Undeter		< 500 m		< 50%			

Total Score: 36



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	08/30/04	Stream Name	Unnamed
Road name/ID #	486 Road	Road Location (MoF District)	Skeena / Stikine
UTM/GPS Location	E 636533 / N 6172452	Watershed Code	480-360200-42300
1:20 000 Map Sheet	093M.067	Recorder's Name	REK
Site Number	90		

Culvert

Round CMP, 13 m long, shallow water depths at time of assessment.

Characteristics:

Culvert Diameter (mm)	600	Culvert Elev. (m)	U/s	2.42	D/s	3.40	Slope (%)	7.5
Culvert Length (m)	13	High Water Mark (cm)	out 17					
Culvert Material	Steel	Culvert Water Depth (cm)	In 2 / out 2					
Culvert Water Velocity (m/sec)	<.1	<.1	<.1	<.1	Culvert Outfall Drop (cm)	5		
Culvert Shape	Round	Culvert Inflow Drop (cm)	0					
Culvert Embedded (yes/no)	No	Depth Embedded	Inlet (cm)	0	Outlet (cm)	0		
Culvert Wetted Width (cm)	In 25 / out 19	Culvert Maintenance (Hi/Mod/L/No)	L					
Coefficient of Roughness	.18	Fill Slope Depth (m)	U/S	1.11	D/S	1.94		

Stream

Fish observed at time of the FPCI assessment at culvert inflow pool. Approximately 90 mm DV / BT and another at approximately 17mcm upstream. Stream above road has channel modified by harvesting.

Characteristics:

Stream Reach	1	Stream Classification	S4				
Pool Depth at Outfall (cm)	3	S1 S2 S3 S4 S5 S6 P					
Sediment Source/Degree	Road runoff	Blue Listed / Significant Spp.	DV / BT				
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	0.61	0.44	0.73	0.92	0.55	0.66	0.65
Bankfull Width (m)	0.63	0.81	0.85	0.92	0.55	0.66	0.74
Water Depth (cm) .25 of width	5	0	5	8	5	8	5
Water Depth (cm) .5 of width	4	4	9	8	10	12	9
Water Depth (cm) .75 of width	5	1	7	14	16	15	10
Bankfull Depth (cm)	24	24	20	23	46	38	29
Stream Water Velocity (m/sec)	<.1	<.1	.1	<.1	<.1	<.1	<.1
Average Stream Gradient (%)	7			8			7.5
Maximum Stream Gradient (%)	7			10			8
Length of Maximum Grade (m)	10			4			N/A
Coefficient of Roughness	.040			.040			N/A
Fish Presence - yes, no, no survey	Yes (CP 658-3)			Yes			N/A
Fish Sampling Method	VO			VO			N/A
Sampling Effort (time)	-			-			N/A
Species Present	DV / BT			DV / BT			N/A
Beaver Activity/Type	No			No			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial
Barrier Type:	Outlet drop 5 cm with 3 cm pool and undersized culvert. Culvert gradient 7.5%.

Site Photos:

Roll #:	REK 12	Inlet downstream photo:	22
Inlet upstream photo:	21	Outlet downstream photo:	24
Outlet upstream photo:	23		

**Site 486-90
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments:

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	900	Stream Length Above Barrier (m)	3200 m
Road Responsibility		% Stream Barred	59%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant	10	H		Full		≥ 1 km	8	> 70%	10	Yes	
Single		M	7	Partial	7	< 1 km ≥ 500 m		≥50-70%		No	0
Other		L		Undeter		< 500 m		< 50%			

Total Score: 42



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	08/30/04	Stream Name	Unnamed
Road name/ID #	486 Road	Road Location (MoF District)	Skeena / Stikine
UTM/GPS Location	E 636434 / N 6173275	Watershed Code	480-360200-42300-
1:20 000 Map Sheet	093M.067	Recorder's Name	REK, HZ
Site Number	Feature 98		

Culvert

Culvert 20 cm above stream bed at outlet and 32 cm above bed at inlet.

Characteristics:

Culvert Diameter (mm)	600	Culvert Elev. (m)	U/s	2.45	D/s	2.95	Slope (%)	4.8
Culvert Length (m)	10.4		High Water Mark (cm)		In 22 / Out 24			
Culvert Material	Metal		Culvert Water Depth (cm)		In 3 / Out 3			
Culvert Water Velocity (m/sec)	0.3	0.3	0.2	0.3	Culvert Outfall Drop (cm)		1	
Culvert Shape	Round		Culvert Inflow Drop (cm)		0			
Culvert Embedded (yes/no)	No		Depth Embedded	Inlet (cm)	0		Outlet (cm)	20
Culvert Wetted Width (cm)	In 21 / out 21		Culvert Maintenance (Hi/Mod/L/No)		L			
Coefficient of Roughness	.018		Fill Slope Depth (m)	U/S	0.27	D/S	0.74	

Stream

BM varies throughout reach from Gravel and Fines to predominantly Fines / Organic.

Characteristics:

Stream Reach	1		Stream Classification		S4		
Pool Depth at Outfall (cm)	38		S1 S2 S3 S4 S5 S6 P				
Sediment Source/Degree	Road and ditch runoff/low		Blue Listed / Significant Spp.		DV/ BT		
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	1.35	0.79	1.17	0.82	0.74	0.79	0.94
Bankfull Width (m)	1.54	0.87	1.24	1.13	1.13	1.02	1.16
Water Depth (cm) .25 of width	17	10	12	10	0	0	8
Water Depth (cm) .5 of width	18	9	12	10	2	6	10
Water Depth (cm) .75 of width	30	9	13	10	2	6	12
Bankfull Depth (cm)	27	37	41	26	28	17	29
Stream Water Velocity (m/sec)	0.2	<.1	<.1	0.1	0.1	<.1	<.1
Average Stream Gradient (%)	6			4			5
Maximum Stream Gradient (%)	6			5			5.5
Length of Maximum Grade (m)	-			-			N/A
Coefficient of Roughness	.04			.04			N/A
Fish Presence - yes, no, no survey	Yes			No survey			N/A
Fish Sampling Method	VO @ 0+511 d/s			-			N/A
Sampling Effort (time)	-			No barriers to u/s passage			N/A
Species Present	DV / BT			-			N/A
Beaver Activity/Type	No			No			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial
Barrier Type:	Undersized pipe

Site Photos:

Roll #:	REK 13		
Inlet upstream photo:	3	Inlet downstream photo:	2
Outlet upstream photo:	1	Outlet downstream photo:	2

**Site 486-98
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments:
Severely undersized culvert.

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	1200	Stream Length Above Barrier (m)	400 m
Road Responsibility		% Stream Barred	40%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant	10	H		Full		≥ 1 km		> 70%		Yes	
Single		M	4	Partial	7	< 1 km ≥ 500 m	3	≥50-70%		No	0
Other		L		Undeter		< 500 m		< 50%	3		

Total Score: 27

Form B – FPCI Summary Table Nilkitkwa River Watershed

Fish Passage – Culvert Inspection Summary Table

Priority Rank	Score	Road	Site Number	Barrier	Stream Length Gained (m)	% Stream Barred	X-Reference Site Number(s)	FIA Eligible
1	49	481	17	Partial	2800	90	481-03-02	Yes
2	42	486	90	Partial	3200	59	---	Yes
3	41	481	8	Partial	1200	86	---	Yes
4	39	480	1720	Partial	1800	88	---	Yes
5	38	4000	607	Partial	1400	78	---	Yes
6	36	481-03	2	Partial	1800	60	481-17	Yes
7	30	4000	588	Partial	<500	86	---	Yes
8	29	471	1	Full	1400	58	---	Yes
9	28	480	1666	Full	200	40	---	Yes
10	27	486	98	Partial	400	40	---	Yes

Form C – Other Priority Culvert Crossings Summary Nilkitkwa River Watershed

Other Priority Culvert Crossings Summary Table

Priority Rating	Site Number	Maintenance Issues	Sediment Source	Notes
*				

* No Other Priority Culvert Crossings for Nilkitkwa River Watershed Area.

Nilkitkwa River Watershed Form D – Sites not Assessed Summary Table

Site Number	Assessment	Notes
<u>4000 Rd.</u>		
Feature 589	Non-Fish Bearing	EF - NFC
Feature 612	Non-Fish Bearing	MT - NFC
Feature 613	Non-Fish Bearing	EF - NFC
Feature 617	Non-Fish Bearing	EF - NFC
Feature 618	Non-Fish Bearing	EF - NFC
Feature 628	Non-Fish Bearing	EF - NFC
Feature 771	Non-Fish Bearing	EF/ MT - NFC
Feature 780	Non-Fish Bearing	Isolated on landscape, MT - NFC
<u>469C Rd.</u>		
0+135	Non-Classified Drainage	
0+264	x-drain	
0+305	x-drain	Partially buried inlet
0+416	x-drain	
0+550	Non-Fish Bearing	
0+690	Non-Classified Drainage	
0+825	x-drain	
0+915	x-drain	
<u>470B Rd.</u>		
1	x-drain	
2	x-drain	
3	x-drain/ Non-Classified Drainage	
4	x-drain	ford
5	x-drain	
<u>472 Rd.</u>		
	No Culverts	
<u>477D Rd.</u>		
11	Non-Fish Bearing	EF - NFC
13	Non-Fish Bearing	EF - NFC
14	Non-Fish Bearing	EF - NFC
24	Non-Fish Bearing	EF - NFC
<u>477I Rd.</u>		
3	Non-Fish Bearing	EF - NFC
<u>480 Rd.</u>		
1610	Non-Classified Drainage	
1620	Non-Fish Bearing	EF - NFC
1623A	Non-Classified Drainage	
1669	Non-Fish Bearing	MT - NFC
1693	Non-Fish Bearing	Water level too low for sampling.

**Nilkitkwa River Watershed
Form D – Sites not Assessed Summary Table**

Site Number	Assessment	Notes
<u>481-03 Rd.</u>		
1	Non-Classified Drainage	
<u>481 Rd.</u>		
42	Non-Fish Bearing	Water level too low for sampling.
<u>486 Rd.</u>		
101	Non-Fish Bearing	EF/ MT - NFC
103	Non-Fish Bearing	EF/ MT - NFC
108	Non-Classified Drainage	
<u>621-5 Spur</u>	No Culverts	

TAB 2 APPENDIX 2 – BABINE RIVER WATERSHED

Table 2. Summary of Sampling Effort and Results
Form A with Photo pages
Form B
Form C
Form D

Table 2. Summary of Sampling Effort and Results in the Babine River watershed.

Site Number	Method/ No.	1:20,000 K Mapping?	Previous Stream Classification	Stream Classification	Fish Presence/ Species	Comments
454A Road						
4	2 MT	Yes	Inferred S3	S4	DV/ BT	Trapped d/s of crossing
10	2 MT	Yes	Inferred Fish	S6	NFC	
456 Road						
6	EF	Yes	Inferred S3	S6	NFC	
49	EF	Yes	Inferred S6	S6	NFC	
53	EF	Yes	Inferred Fish	S6	NFC	
457 Road						
16	MT	Yes	Inferred S4	S6	NFC	
28	6 MT	Yes	Inferred S4	S4	RB	Fish caught d/s of crossing near beaver ponds.
34	3 MT/ EF	Yes	Inferred S4	S6	NFC	
74	EF	Yes	Inferred Fish	S4	NFC	
465 Road						
31	MT	Yes	S3	S3	RB	
632-2 Spur						
	MT	Yes	Inferred S4	S6	NFC	
632-5 Spur						
10	MT/ EF	Yes	Inferred S4	S6	NFC	

Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	07/09/04	Stream Name	Unnamed
Road name/ID #	454A	Road Location (MoF District)	Skeena /Stikine
UTM/GPS Location	E 644907 / N 6142828	Watershed Code	480-378100-
1:20 000 Map Sheet	093M.047	Recorder's Name	DB/ HZ
Site Number	454A-4		

Culvert

Outlet staging pool is partially obstructed by LWD and boulders. Culvert is bent and is pooling water at the inlet.

Characteristics:

Culvert Diameter (mm)	900	Culvert Elev. (m)	U/s	3.18	D/s	3.10	Slope (%)	.007
Culvert Length (m)	12 m	High Water Mark (cm)	20					
Culvert Material	metal	Culvert Water Depth (cm)	4					
Culvert Water Velocity (m/sec)	In <.1	Out .4	Culvert Outfall Drop (cm)	32				
Culvert Shape	Circular	Culvert Inflow Drop (cm)	0					
Culvert Embedded (yes/no)	No	Depth Embedded	Inlet (cm)	5	Outlet (cm)	-		
Culvert Wetted Width (cm)	20	Culvert Maintenance (Hi/Mod/L/No)						
Coefficient of Roughness	.018	Fill Slope Depth (m)	U/S	.5	D/S	.41		

Stream

Cascade pool section downstream of CV, riffle pool upstream of CV with abundant instream and over vegetation stream cover.

Characteristics:

Stream Reach	1	Stream Classification	S4				
Pool Depth at Outfall (cm)	10	S1 S2 S3 S4 S5 S6 P					
Sediment Source/Degree	low	Blue Listed / Significant Spp.	BV/BT				
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	.70	1.22	.74	1.40	.98	.97	1.00
Bankfull Width (m)	.70	1.22	.99	1.50	.98	.97	1.06
Water Depth (cm) .25 of width	10	5	0	15	18	17	11
Water Depth (cm) .5 of width	25	11	11	7	7	23	14
Water Depth (cm) .75 of width	18	11	15	30	12	.9	16
Bankfull Depth (cm)	31	14	21	48	51	38	34
Stream Water Velocity (m/sec)	<.1	.2	0.1	<.1	<.1	<.1	.1
Average Stream Gradient (%)	44			2			3
Maximum Stream Gradient (%)	8			3			5.5
Length of Maximum Grade (m)	12 m			40 m			N/A
Coefficient of Roughness	.04			.04			N/A
Fish Presence - yes, no, no survey	Yes			No survey			N/A
Fish Sampling Method	MT			None			N/A
Sampling Effort (time)	Overnight set			---			N/A
Species Present	DV/BT			---			N/A
Beaver Activity/Type	None			None			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial
Barrier Type:	Outlet drop / poor staging pool access

Site Photos:

Roll #:	REK 7	Inlet upstream photo:	10	Inlet downstream photo:	11
Outlet upstream photo:	10	Outlet downstream photo:	12, 13		

**Site 454A-4
Form A –Fish Passage – Culvert Inspection – Side 2**

Comments:

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	1200	Stream Length Above Barrier (m)	850 m
Road Responsibility	PIR	% Stream Barred	89%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant	10	H		Full		≥ 1 km		> 70%	10	Yes	
Single		M	7	Partial	7	< 1 km ≥ 500 m	3	≥50-70%		No	0
Other		L		Undeter		< 500 m		< 50%			

Total Score: 37



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	07/09/04	Stream Name	Unnamed
Road name/ID #	454B	Road Location (MoF District)	Skeena /Stikine
UTM/GPS Location	E 641962 / N 6143303	Watershed Code	480-370100-
1:20 000 Map Sheet	093M.047	Recorder's Name	DB, HZ
Site Number	454B-9		

Culvert

Culvert is very long for road width. Culvert perched 8 cm above inlet and outlet.

Characteristics:

Culvert Diameter (mm)	1200	Culvert Elev. (m)	U/s	3.97	D/s	3.05	Slope (%)	7.7
Culvert Length (m)	12.0		High Water Mark (cm)		17			
Culvert Material	Metal		Culvert Water Depth (cm)		5			
Culvert Water Velocity (m/sec)	In	.4	Out	.7	Culvert Outfall Drop (cm)		2	
Culvert Shape	Circular		Culvert Inflow Drop (cm)		-			
Culvert Embedded (yes/no)	No	Depth Embedded	Inlet (cm)	-	Outlet (cm)	-		
Culvert Wetted Width (cm)	52 Outlet		Culvert Maintenance (Hi/Mod/L/No)		Low			
Coefficient of Roughness	.020	Fill Slope Depth (m)	U/S	.76	D/S	0.60		

Stream

Riffle pools with small gravel and fines. Thick alder vegetation. Good fish habitat and good spawning habitat near crossing. Possible o/w if flow remains good for winter months. Conductivity: 83, PH 7.9, Temperature 11.5

Characteristics:

Stream Reach	1		Stream Classification		S3		
Pool Depth at Outfall (cm)	2		S1 S2 S3 S4 S5 S6 P				
Sediment Source/Degree	Low		Blue Listed / Significant Spp.				
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	1.02	1.03	1.42	1.05	1.78	1.74	1.44
Bankfull Width (m)	1.64	1.67	1.75	2.00	1.82	1.74	1.77
Water Depth (cm) .25 of width	12	12	36	0	10	10	13
Water Depth (cm) .5 of width	2	11	21	0	10	11	10
Water Depth (cm) .75 of width	1	15	20	9	7	14	11
Bankfull Depth (cm)	34	36	68	14	48	33	39
Stream Water Velocity (m/sec)	<.1	.1	.1	.1	.3	.1	.1
Average Stream Gradient (%)	3			4			3.5
Maximum Stream Gradient (%)	3			4			3.5
Length of Maximum Grade (m)	-			-			N/A
Coefficient of Roughness	.04			.04			N/A
Fish Presence - yes, no, no survey	No survey			No survey			N/A
Fish Sampling Method	n/a			n/a			N/A
Sampling Effort (time)	Nil			Nil			N/A
Species Present	RB (Triton map)			Unknown			N/A
Beaver Activity/Type	None			none			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial
Barrier Type:	Velocity at higher flows, culvert gradient.

Site Photos:

Roll #:	REK 7	Inlet upstream photo:	7	Inlet downstream photo:	6
Outlet upstream photo:	9	Outlet downstream photo:	8		

**Site 454B-9
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments: Passage of fish is possible at most flow levels. The culvert is bent in the middle, which slows the water velocity. The remainder of the culvert contains high water velocity for approximately 7 m down to the outlet. Undersized pipe.

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	1800	Stream Length Above Barrier (m)	2200
Road Responsibility		% Stream Barred	40%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant		H	10	Full		≥ 1 km	Lake 10	> 70%		Yes	
Single	6	M		Partial	7	< 1 km ≥ 500 m		≥50-70%		No	0
Other		L		Undeter		< 500 m		< 50%	3		

Total Score: 36



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	07/08/04	Stream Name	Unnamed
Road name/ID #	454B	Road Location (MoF District)	Skeena /Stikine
UTM/GPS Location	E 642962 / N 6143533	Watershed Code	480-
1:20 000 Map Sheet	93M.047	Recorder's Name	DB/ HZ
Site Number	454B-11		

Culvert

Bent in the middle and appears to be undersized.

Characteristics:

Culvert Diameter (mm)	600	Culvert Elev. (m)	U/s	2.57	D/s	2.50	Slope (%)	.7%
Culvert Length (m)	10	High Water Mark (cm)	17					
Culvert Material	Metal	Culvert Water Depth (cm)	2					
Culvert Water Velocity (m/sec)	<.1	m/s	Culvert Outfall Drop (cm)	5				
Culvert Shape	Circular	Culvert Inflow Drop (cm)	0					
Culvert Embedded (yes/no)	No	Depth Embedded	Inlet (cm)	-	Outlet (cm)	-		
Culvert Wetted Width (cm)	23	Culvert Maintenance (Hi/Mod/L/No)	Low					
Coefficient of Roughness	.018	Fill Slope Depth (m)	U/S	.42	D/S	0.35		

Stream

Channel flowing through alder swale. BM fines and organics. Few pools present. No barriers downstream to previously classified fish bearing reach. This channel was completely dry on August 17, 2004.

Characteristics:

Stream Reach	2	Stream Classification	Defaulted S4				
Pool Depth at Outfall (cm)	14	S1 S2 S3 S4 S5 S6 P					
Sediment Source/Degree	None	Blue Listed / Significant Spp.	-				
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	1.20	.40	1.40	.65	.90	.51	.93
Bankfull Width (m)	1.05	.90	1.10	.75	.90	.79	.92
Water Depth (cm) .25 of width	8	2	4	8	8	5	6
Water Depth (cm) .5 of width	6	2	2	7	9	3	5
Water Depth (cm) .75 of width	7	3	0	4	9	2	4
Bankfull Depth (cm)	15	10	10	20	26	28	18
Stream Water Velocity (m/sec)	<.1	m/s					<.1
Average Stream Gradient (%)	2			2			2
Maximum Stream Gradient (%)	2			2			2
Length of Maximum Grade (m)	-			-			N/A
Coefficient of Roughness	.04			.04			N/A
Fish Presence - yes, no, no survey	No Survey – Conductivity too			low and water level too shallow			N/A
Fish Sampling Method	None			None			N/A
Sampling Effort (time)	-			-			N/A
Species Present	RB D/S in R 1			-			N/A
Beaver Activity/Type	D/S 0+900 m			None			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial
Barrier Type:	Undersized culvert and outlet drop of 5 cm with 14 cm pool.

Site Photos:

Roll #:	REK 7		
Inlet upstream photo:	2	Inlet downstream photo:	3
Outlet upstream photo:	5	Outlet downstream photo:	4

**Site 454B-11
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments: Low water level at time of survey. No spawning and no over wintering habitat.

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	900	Stream Length Above Barrier (m)	600
Road Responsibility	PIR	% Stream Barred	15%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant		H		Full		≥ 1 km		> 70%		Yes	
Single	6	M		Partial	4	< 1 km ≥ 500 m	3	≥50-70%		No	0
Other		L	3	Undeter		< 500 m		< 50%	3		

Total Score: 19



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	07/21/04	Stream Name	Unnamed
Road name/ID #	456 Road	Road Location (MoF District)	Skeena /Stikine
UTM/GPS Location	E 638464 / N 6149737	Watershed Code	480-370100-
1:20 000 Map Sheet	093M.046	Recorder's Name	REK
Site Number	456-40		

Culvert

Leap at outlet obstructed by rocks.

Characteristics:

Culvert Diameter (mm)	1400	Culvert Elev. (m)	U/s	8.91	D/s	10.01	Slope (%)	4.2
Culvert Length (m)	26 m	High Water Mark (cm)	26 inlet/29 outlet					
Culvert Material	Steel	Culvert Water Depth (cm)	7 inlet/8 outlet					
Culvert Water Velocity (m/sec)	0.7	1.8	1.3	-	Culvert Outfall Drop (cm)	20		
Culvert Shape	Round	Culvert Inflow Drop (cm)	0					
Culvert Embedded (yes/no)	No-flush	Depth Embedded	Inlet (cm)	0	Outlet (cm)	0		
Culvert Wetted Width (cm)	67 in/54 out	Culvert Maintenance (Hi/Mod/L/No)						
Coefficient of Roughness	.021	Fill Slope Depth (m)	U/S	5.11	D/S	6.21		

Stream

Characteristics:

Stream Reach	1	Stream Classification	S3				
Pool Depth at Outfall (cm)	10	S1 S2 S3 S4 S5 S6 P					
Sediment Source/Degree	Low	Blue Listed / Significant Spp.	DV				
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	2.35	1.70	2.60	1.55	2.70	1.75	2.11
Bankfull Width (m)	2.35	1.70	2.60	1.60	2.70	1.85	2.15
Water Depth (cm) .25 of width	6	14	19	6	7	10	10
Water Depth (cm) .5 of width	7	19	14	8	15	20	14
Water Depth (cm) .75 of width	13	11	35	7	6	21	16
Bankfull Depth (cm)	23	27	43	24	31	30	30
Stream Water Velocity (m/sec)	0.1	0.1	0.4	0.3	0.1	0.4	0.3
Average Stream Gradient (%)	4			5			4.5
Maximum Stream Gradient (%)	7			6			4.5
Length of Maximum Grade (m)	5			7			N/A
Coefficient of Roughness	.04			.04			N/A
Fish Presence - yes, no, no survey	Yes			---			N/A
Fish Sampling Method	Triton 1:20 K inv			---			N/A
Sampling Effort (time)	Site R25			---			N/A
Species Present	DV			---			N/A
Beaver Activity/Type	None			None			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial
Barrier Type:	Water velocity and outfall drop.

Site Photos:

Roll #:	REK 8	Inlet downstream photo:	9
Inlet upstream photo:	14	Outlet downstream photo:	10
Outlet upstream photo:	11		

**Site 456-40
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments:

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	1800	Stream Length Above Barrier (m)	2500 m
Road Responsibility	PIR	% Stream Barred	57%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant	10	H	10	Full		≥ 1 km	7	> 70%		Yes	
Single		M		Partial	7	< 1 km ≥ 500 m		≥50-70%	6	No	0
Other		L		Undeter		< 500 m		< 50%			

Total Score: 40



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	07/16/04	Stream Name	Unnamed
Road name/ID #	457 Road	Road Location (MoF District)	Skeena /Stikine
UTM/GPS Location	E 642621 / N 6148774	Watershed Code	480-
1:20 000 Map Sheet	093M.047	Recorder's Name	DB, RK
Site Number	457-6		

Culvert

Long Pipe with outflow drop. Undersized for stream. Outflow drop lands partially on large rock, which partially restricts fish access into pipe.

Characteristics:

Culvert Diameter (mm)	900	Culvert Elev. (m)	U/s	6.95	D/s	7.34	Slope (%)	2
Culvert Length (m)	20 m		High Water Mark (cm)		33 out/ 28 in			
Culvert Material	Metal		Culvert Water Depth (cm)		6 out/ 6 in			
Culvert Water Velocity (m/sec)	.4	Out	.6	In	Culvert Outfall Drop (cm)		22	
Culvert Shape	Circular		Culvert Inflow Drop (cm)		0			
Culvert Embedded (yes/no)	No	Depth Embedded	Inlet (cm)	Flush	Outlet (cm)	0		
Culvert Wetted Width (cm)	43 out/ 33 in		Culvert Maintenance (Hi/Mod/L/No)		No			
Coefficient of Roughness	.018	Fill Slope Depth (m)	U/S	3.58	D/S	4.09		

Stream

Riffle pool - rock with dominant gravels and fines downstream of the crossing. Gravel and cobbles upstream of crossing. Good fish habitat, including spawning and over-wintering habitat. Salmonid fry observed at inlet.

Characteristics:

Stream Reach			Stream Classification		S3		
Pool Depth at Outfall (cm)	48		S1 S2 S3 S4 S5 S6 P				
Sediment Source/Degree	no		Blue Listed / Significant Spp.		-		
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	2.12	1.70	1.20	1.10	1.65	1.80	1.60
Bankfull Width (m)	2.12	2.10	3.10	1.70	1.85	2.30	2.20
Water Depth (cm) .25 of width	10	13	7	9	4	3	8
Water Depth (cm) .5 of width	6	3	0	12	11	10	7
Water Depth (cm) .75 of width	5	2	0	0	9	7	4
Bankfull Depth (cm)	30	23	24	25	26	22	25
Stream Water Velocity (m/sec)	.3	<.1	.2	<.1	.4	.2	.18
Average Stream Gradient (%)	4			3			3
Maximum Stream Gradient (%)	5			4			4.5
Length of Maximum Grade (m)	50			30			N/A
Coefficient of Roughness	.04			.04			N/A
Fish Presence - yes, no, no survey	Yes			Yes			N/A
Fish Sampling Method	Triton			Triton			N/A
Sampling Effort (time)	-			-			N/A
Species Present	Unknown			Salmonid fry observed at inlet, RB spawning habitat recorded by Triton			N/A
Beaver Activity/Type	None			None			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial
Barrier Type:	Outfall drop of 22 cm with 48 cm pool and undersized culvert.

Site Photos:

Roll #:	REK 7	Inlet upstream photo:	22	Inlet downstream photo:	23
Outlet upstream photo:	20	Outlet downstream photo:	19		

**Site 457-6
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments:
Undersized culvert.

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	1400	Stream Length Above Barrier (m)	4800 m
Road Responsibility	PIR	% Stream Barred	65%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species	Habitat Value	Barrier	Length of New Habitat	Stream Barred (%)	Limiting to Upstream Barrier
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Multiple or Significant		H	10	Full		≥ 1 km	10	> 70%		Yes	
Single	6	M		Partial	7	< 1 km ≥ 500 m		≥50-70%	6	No	0
Other		L		Undeter		< 500 m		< 50%			

Total Score: 39

Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	07/16/04	Stream Name	Unnamed
Road name/ID #	457 Road	Road Location (MoF District)	Skeena /Stikine
UTM/GPS Location	E 642132 / N 6149780	Watershed Code	480-
1:20 000 Map Sheet	093M.047	Recorder's Name	DB, RK
Site Number	457-14		

Culvert

Minor dents at inlet and outlet. Appears to be undersized for stream channel width.

Characteristics:

Culvert Diameter (mm)	600	Culvert Elev. (m)	U/s	2.76	D/s	3.00	Slope (%)	3
Culvert Length (m)	8		High Water Mark (cm)		23 in/ 24 out			
Culvert Material	Metal		Culvert Water Depth (cm)		4 in/ 8 out			
Culvert Water Velocity (m/sec)	1.0	In	0.4	Out	Culvert Outfall Drop (cm)		0	
Culvert Shape	Circular		Culvert Inflow Drop (cm)		0			
Culvert Embedded (yes/no)	No	Depth Embedded	Inlet (cm)	Flush	Outlet (cm)	Flush		
Culvert Wetted Width (cm)	33 in/ 40 out		Culvert Maintenance (Hi/Mod/L/No)		L			
Coefficient of Roughness	.018	Fill Slope Depth (m)	U/S	0.58	D/S	0.69		

Stream

Downstream of crossing there are dominant fines with few gravels. Riffle/ Pool morphology. Good flow at the time of the survey. Abundant overhanging vegetation provided by alder and dogwood. Upstream of the crossing predominant bed material is fines and gravels.

Characteristics:

Stream Reach	1		Stream Classification		S3		
Pool Depth at Outfall (cm)	33		S1 S2 S3 S4 S5 S6 P				
Sediment Source/Degree	Ditch line (mud)		Blue Listed / Significant Spp.		-		
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	3.30	1.00	1.10	1.30	1.60	3.10	1.90
Bankfull Width (m)	3.30	1.35	2.20	1.40	1.80	3.10	2.19
Water Depth (cm) .25 of width	23	4	1	6	12	8	9
Water Depth (cm) .5 of width	14	7	9	8	14	10	10
Water Depth (cm) .75 of width	2	8	1	11	7	8	6
Bankfull Depth (cm)	26	20	20	28	26	23	24
Stream Water Velocity (m/sec)	<.1	<.1	<.1	.1	<.1	<.1	<.1
Average Stream Gradient (%)	2			3			2.5
Maximum Stream Gradient (%)	2			4			3
Length of Maximum Grade (m)	30			30			N/A
Coefficient of Roughness	.040			.040			N/A
Fish Presence - yes, no, no survey	No survey			Triton Survey			N/A
Fish Sampling Method	-			-			N/A
Sampling Effort (time)	-			-			N/A
Species Present	Unknown- salmonid fry observed			Rb			N/A
Beaver Activity/Type	None			None			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial
Barrier Type:	Water velocity and undersized culvert

Site Photos:

Roll #: REK 8

Inlet upstream photo: 1 Inlet downstream photo: 2

Outlet upstream photo: 5 Outlet downstream photo: 4

#3 Ditch line on upstream of crossing (minor sed input)

**Site 457-14
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments:
Severely undersized culvert.

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	1600	Stream Length Above Barrier (m)	9000
Road Responsibility		% Stream Barred	82%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant		H	8	Full		≥ 1 km	10	> 70%	10	Yes	
Single	6	M		Partial	7	< 1 km ≥ 500 m		≥50-70%		No	0
Other		L		Undeter		< 500 m		< 50%			

Total Score: 41



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	08/17/04	Stream Name	Unnamed
Road name/ID #	457 Road	Road Location (MoF District)	Skeena /Stikine
UTM/GPS Location	E 641180 / N 6151711	Watershed Code	480-
1:20 000 Map Sheet	093M.047	Recorder's Name	DB, REK
Site Number	457-28		

Culvert

Undersized, high gradient

Characteristics:

Culvert Diameter (mm)	600	Culvert Elev. (m)	U/s	2.67	D/s	3.20	Slope (%)	5.9
Culvert Length (m)	9.0		High Water Mark (cm)		18 out/ 12 in			
Culvert Material	Metal		Culvert Water Depth (cm)		5 out/ 2 in			
Culvert Water Velocity (m/sec)	0.4	0.2	0.3	<0.1	Culvert Outfall Drop (cm)		0	
Culvert Shape	Circular		Culvert Inflow Drop (cm)		0			
Culvert Embedded (yes/no)	No	Depth Embedded	Inlet (cm)	Flush	Outlet (cm)	Flush		
Culvert Wetted Width (cm)	43 out/ 20 in		Culvert Maintenance (Hi/Mod/L/No)			L		
Coefficient of Roughness	.018	Fill Slope Depth (m)	U/S	.28	D/S	.67		

Stream

The stream is heavily covered with alder and other shrubs. The stream runs along the ditchline for approximately 30 m before entering the culvert. Poor fish habitat upstream of crossing, abundant algae and angular substrate. Very low water at the time of the survey. Stream is likely ephemeral upstream of crossing. Contains poor fish habitat upstream of crossing – no deep pools and angular substrate. Downstream of crossing, habitat increases with proximity to ponds.

Characteristics:

Stream Reach	1		Stream Classification		S4		
Pool Depth at Outfall (cm)	22		S1 S2 S3 S4 S5 S6 P				
Sediment Source/Degree	L		Blue Listed / Significant Spp.		-		
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	0.75	0.0	1.40	1.00	.80	.30	0.71
Bankfull Width (m)	0.95	1.08	1.70	1.12	.25	1.05	1.03
Water Depth (cm) .25 of width	2	0	2	0	1	1	1
Water Depth (cm) .5 of width	3	0	3	0	0	0	1
Water Depth (cm) .75 of width	4	0	1	1	1	1	1
Bankfull Depth (cm)	17	25	18	12	20	18	18
Stream Water Velocity (m/sec)	<.1	<.1	<.1	<.1	<.1	<.1	<.1
Average Stream Gradient (%)	7.5			7			7.25
Maximum Stream Gradient (%)	7			10			8.5
Length of Maximum Grade (m)	-			-			N/A
Coefficient of Roughness	.04			.04			N/A
Fish Presence - yes, no, no survey	Yes			No survey			N/A
Fish Sampling Method	MT			None			N/A
Sampling Effort (time)	2 hrs			-			N/A
Species Present	Rb			-			N/A
Beaver Activity/Type	Series of ponds/dams			None			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial
Barrier Type:	An undersized and gradient >5% aid in creating excessive water velocity through pipe.

Site Photos:

Roll #:	REK 11	Inlet upstream photo:	3, 5	Inlet downstream photo:	4
Outlet upstream photo:	2	Outlet downstream photo:	1		



**Site 457-28
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments:

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	1000	Stream Length Above Barrier (m)	400 m
Road Responsibility		% Stream Barred	60%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant		H		Full		≥ 1 km		> 70%		Yes	
Single	6	M		Partial	6	< 1 km ≥ 500 m		≥50-70%	6	No	0
Other		L	3	Undeter		< 500 m	3	< 50%			

Total Score: 24



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	07/22/04	Stream Name	Unnamed
Road name/ID #	457 Road	Road Location (MoF District)	Skeena /Stikine
UTM/GPS Location	E 639831 / N 6153549	Watershed Code	480-335200
1:20 000 Map Sheet	093M	Recorder's Name	REK
Site Number	457-48		

Culvert

Minor dents in sides at inlet. Very little fill over culvert (approx. 10 cm)

Characteristics:

Culvert Diameter (mm)	800	Culvert Elev. (m)	U/s	2.51	D/s	2.68	Slope (%)	2
Culvert Length (m)	8.0	High Water Mark (cm)	7 in / 7 out					
Culvert Material	Steel	Culvert Water Depth (cm)	2 in / 5 out					
Culvert Water Velocity (m/sec)	<.1	<.1	Culvert Outfall Drop (cm)	0 – flush with bed				
Culvert Shape	Round	Culvert Inflow Drop (cm)	6					
Culvert Embedded (yes/no)	No	Depth Embedded	Inlet (cm)	0	Outlet (cm)	Flush		
Culvert Wetted Width (cm)	21 in/ 42 out	Culvert Maintenance (Hi/Mod/L/No)	Low					
Coefficient of Roughness	.018	Fill Slope Depth (m)	U/S	0.07	D/S	0.07		

Stream

This stream is a side channel or flood channel of the Stream at 457-49 – a known fish bearing stream.

Characteristics:

Stream Reach	1	Stream Classification	S4				
Pool Depth at Outfall (cm)	5	S1 S2 S3 S4 S5 S6 P					
Sediment Source/Degree	Road runoff / low	Blue Listed / Significant Spp.	-				
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	2.10	0.90	0.80	1.15	0.80	-	1.15
Bankfull Width (m)	2.10	1.75	0.90	1.25	2.10	1.75	1.48
Water Depth (cm) .25 of width	1	0	4	4	-	-	2
Water Depth (cm) .5 of width	1	3	5	10	4	-	4
Water Depth (cm) .75 of width	4	4	5	10	1	-	4
Bankfull Depth (cm)	6	17	8	15	12	15	12
Stream Water Velocity (m/sec)	<0.1	<0.1	<0.1	<0.1	<0.1	-	<.1
Average Stream Gradient (%)	1.3			6			3.3
Maximum Stream Gradient (%)	3			6			3
Length of Maximum Grade (m)	10			20			N/A
Coefficient of Roughness	.04			.04			N/A
Fish Presence - yes, no, no survey	Yes			Yes			N/A
Fish Sampling Method	Triton 1:20 K			Triton 1:20 K			N/A
Sampling Effort (time)	Site			Site			N/A
Species Present							N/A
Beaver Activity/Type	None			None			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	None
Barrier Type:	None

Site Photos:

Roll #:	REK 8		
Inlet upstream photo:	21	Inlet downstream photo:	20
Outlet upstream photo:	23	Outlet downstream photo:	22

**Site 457-48
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments:

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	800 mm	Stream Length Above Barrier (m)	300 m
Road Responsibility		% Stream Barred	No barrier

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant		H		Full		≥ 1 km		> 70%		Yes	
Single	6	M	6	Partial		< 1 km ≥ 500 m		≥50-70%		No	0
Other		L		Undeter	0	< 500 m	0	< 50%	0		

Total Score: 12



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	08/02/04	Stream Name	Unnamed
Road name/ID #	457 Road	Road Location (MoF District)	Skeena/Stikine
UTM/GPS Location	E 638182 / N 6156114	Watershed Code	480-335200-
1:20 000 Map Sheet	093M.056	Recorder's Name	REK
Site Number	74		

Culvert

Round culvert flush with stream at inlet. Outlet has a .20 m vertical drop onto SWD, 22 cm pool immediately below SWD.

Characteristics:

Culvert Diameter (mm)	1200	Culvert Elev. (m)	U/s	3.50	D/s	3.75	Slope (%)	1.6
Culvert Length (m)	16	High Water Mark (cm)	14 in / 7 out					
Culvert Material	Steel	Culvert Water Depth (cm)	5 in / 2 out					
Culvert Water Velocity (m/sec)	0.1 0.1 - -	Culvert Outfall Drop (cm)	20 cm					
Culvert Shape	Round	Culvert Inflow Drop (cm)	0					
Culvert Embedded (yes/no)	No	Depth Embedded	Inlet (cm)	Flush	Outlet (cm)	-		
Culvert Wetted Width (cm)	50 in / 34 out	Culvert Maintenance (Hi/Mod/L/No)	L					
Coefficient of Roughness	0.02	Fill Slope Depth (m)	U/S	2.12	D/S	1.95		

Stream

Stream has low gradient with fines as pred BM. Cobbles are also present, but not transported by stream. They have dropped out of the soil matrix. Very poor spawning habitat and no over-wintering habitat. Good rearing habitat with lots of overhanging vegetation to provide cover.

Characteristics:

Stream Reach	1			Stream Classification	S4		
Pool Depth at Outfall (cm)	22			S1 S2 S3 S4 S5 S6 P			
Sediment Source/Degree	Road runoff / low			Blue Listed / Significant Spp.	-		
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	0.50	0.70	0.80	1.15	0.70	1.25	0.85
Bankfull Width (m)	1.30	0.70	1.35	1.70	1.00	1.25	1.22
Water Depth (cm) .25 of width	0	6	1	1	4	5	3
Water Depth (cm) .5 of width	0	5	4	14	4	2	5
Water Depth (cm) .75 of width	8	11	4	6	2	4	6
Bankfull Depth (cm)	27	20	24	34	15	14	22
Stream Water Velocity (m/sec)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<.1
Average Stream Gradient (%)	2, 5 (3.5%)			3			3.3
Maximum Stream Gradient (%)	5			3			4
Length of Maximum Grade (m)	5			-			N/A
Coefficient of Roughness	.04			.04			N/A
Fish Presence - yes, no, no survey	-			No survey			N/A
Fish Sampling Method	EF			---			N/A
Sampling Effort (time)	409			-			N/A
Species Present	NFC but no d/s barriers			-			N/A
Beaver Activity/Type	None			None			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial
Barrier Type:	Outlet drop.

Site Photos:

Roll #:	REK 11	Inlet downstream photo:	6
Inlet upstream photo:	7	Outlet downstream photo:	9
Outlet upstream photo:	8		

**Site 457-74
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments:

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	1000	Stream Length Above Barrier (m)	500 m
Road Responsibility		% Stream Barred	40%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
										Yes	
Multiple or Significant		H		Full		≥ 1 km		> 70%		Yes	
Single	6	M	4	Partial	4	< 1 km ≥ 500 m	3	≥50-70%		No	0
Other		L		Undeter		< 500 m		< 50%	3		

Total Score: 20



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	08/24/04	Stream Name	Unnamed
Road name/ID #	457 F Road	Road Location (MoF District)	Skeena/Stikine
UTM/GPS Location	E 638569 / N 6155988	Watershed Code	480-335200-
1:20 000 Map Sheet	093M.056	Recorder's Name	REK
Site Number	457F-4 (Same stream as 457-74)		

Culvert

Culvert is 10 cm above bed at outlet but outlet pool is 12 cm deep, and culvert is relatively low gradient.

Characteristics:

Culvert Diameter (mm)	450	Culvert Elev. (m)	U/s	2.40	D/s	2.22	Slope (%)	2.6
Culvert Length (m)	7		High Water Mark (cm)		23 in / 20 out			
Culvert Material	Steel		Culvert Water Depth (cm)		12 in / 2 out			
Culvert Water Velocity (m/sec)	0.2	<0.1	-	-	Culvert Outfall Drop (cm)		0	
Culvert Shape	Round		Culvert Inflow Drop (cm)		0			
Culvert Embedded (yes/no)	No	Depth Embedded	Inlet (cm)	1-2 cm	Outlet (cm)	0		
Culvert Wetted Width (cm)	44 in / 20 out		Culvert Maintenance (Hi/Mod/L/No)		no			
Coefficient of Roughness		Fill Slope Depth (m)	U/S	0.45	D/S	0.45		

Stream**Characteristics:**

Stream bed predominately fines with gravel and cobbles (drop stones). Very good cover from over vegetation, but no over wintering habitat in stream (over wintering habitat in Twin Lakes) and no suitable spawning substrates. Stream has been routed into ditchline for 16 m before culvert inlet and through a man made channel for 23 m at outlet before returning to its natural channel. Stream flow was low at the time of the inspection.

Stream Reach	1		Stream Classification		S4		
Pool Depth at Outfall (cm)	12		S1 S2 S3 S4 S5 S6 P				
Sediment Source/Degree	Road and ditch runoff / very low		Blue Listed / Significant Spp.		-		
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	1.05	1.25	0.60	0.60	0.90	0.80	0.87
Bankfull Width (m)	1.05	1.25	0.75	1.30	0.95	0.80	1.02
Water Depth (cm) .25 of width	17	12	12	0	8	7	10
Water Depth (cm) .5 of width	3	18	15	4	8	4	9
Water Depth (cm) .75 of width	7	11	14	1	6	5	7
Bankfull Depth (cm)	23	29	23	9	17	12	19
Stream Water Velocity (m/sec)	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<.1
Average Stream Gradient (%)	1, 2, 3 (2%)			1, 0.5			2
Maximum Stream Gradient (%)	3			1			2
Length of Maximum Grade (m)	5			25			N/A
Coefficient of Roughness	.04			.04			N/A
Fish Presence - yes, no, no survey	No survey			-			N/A
Fish Sampling Method	--			EF near u/s crossing 457-74			N/A
Sampling Effort (time)	---			409			N/A
Species Present	Tributary to Twin Lakes with no barriers			NFC			N/A
Beaver Activity/Type	none			none			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Partial
Barrier Type:	Outfall drop and undersized culvert.

Site Photos:

Roll #:	REK 11		
Inlet upstream photo:	13	Inlet downstream photo:	12
Outlet upstream photo:	10	Outlet downstream photo:	11

**Site 457F-4
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments:

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	900	Stream Length Above Barrier (m)	1000 m
Road Responsibility		% Stream Barred	50%

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
										Yes	
Multiple or Significant		H		Full		≥ 1 km		> 70%		Yes	5
Single	6	M		Partial	4	< 1 km ≥ 500 m	4	≥50-70%		No	0
Other		L	3	Undeter		< 500 m		< 50%	3		

Total Score: 25



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	09/01/04	Stream Name	Unnamed
Road name/ID #	465 Road	Road Location (MoF District)	Skeena /Stikine
UTM/GPS Location	E 653285 / N 6150832	Watershed Code	480-378200-
1:20 000 Map Sheet	093M.048	Recorder's Name	HZ, REK
Site Number	Feature 31		

Culvert

Culvert essentially flat (<0.1% gradient). Pipe is probably significantly undersized.

Characteristics:

Culvert Diameter (mm)	1200	Culvert Elev. (m)	U/s	6.33	D/s	6.32	Slope (%)	0
Culvert Length (m)	13.2		High Water Mark (cm)		40 in / 40 out			
Culvert Material	CMP		Culvert Water Depth (cm)		9 in / 8 out			
Culvert Water Velocity (m/sec)	0.3	0.6	0.3	0.3	Culvert Outfall Drop (cm)		0	
Culvert Shape	Round		Culvert Inflow Drop (cm)		Culvert 10 cm above bed			
Culvert Embedded (yes/no)	No		Depth Embedded	Inlet (cm)	0		Outlet (cm)	0
Culvert Wetted Width (cm)	62 in / 68 out		Culvert Maintenance (Hi/Mod/L/No)		L			
Coefficient of Roughness	0.02		Fill Slope Depth (m)	U/S	3.42		D/S	3.48

Stream

Large low gradient stream. Moss and algae present in channel.

Characteristics:

Stream Reach	1		Stream Classification		S3		
Pool Depth at Outfall (cm)	23		S1 S2 S3 S4 S5 S6 P				
Sediment Source/Degree	-		Blue Listed / Significant Spp.		-		
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	1.51	2.14	2.87	2.51	3.33	2.32	2.44
Bankfull Width (m)	2.59	3.25	3.12	3.55	2.95	3.41	3.15
Water Depth (cm) .25 of width	3	14	28	13	6	6	12
Water Depth (cm) .5 of width	12	38	42	23	14	13	24
Water Depth (cm) .75 of width	14	20	30	11	11	11	16
Bankfull Depth (cm)	0.48	0.64	0.63	0.46	0.34	55	52
Stream Water Velocity (m/sec)	0.1	<0.1	<0.1	0.2	0.1	0.1	.1
Average Stream Gradient (%)	2			2, 3			2.3
Maximum Stream Gradient (%)	3			3			3
Length of Maximum Grade (m)	10			10			N/A
Coefficient of Roughness	.05			.05			N/A
Fish Presence - yes, no, no survey	Yes Triton/Silvicon			No survey			N/A
Fish Sampling Method	MT			-			N/A
Sampling Effort (time)	1.75 hrs			-			N/A
Species Present	RB, RSC			-			N/A
Beaver Activity/Type	None			None			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	Undetermined
Barrier Type:	Undersized pipe

Site Photos:

Roll #:	REK 13		
Inlet upstream photo:	24	Inlet downstream photo:	21
Outlet upstream photo:	22	Outlet downstream photo:	23

**Site 465-31
Form A – Fish Passage – Culvert Inspection – Side 2**

Comments: Severely undersized culvert based on Q100 est., but no fish passage concerns.

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	2400	Stream Length Above Barrier (m)	5600
Road Responsibility		% Stream Barred	56

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
Multiple or Significant		H		Full		≥ 1 km	10	> 70%		Yes	
Single	6	M	6	Partial		< 1 km ≥ 500 m		≥50-70%	6	No	0
Other		L		Undeter	0	< 500 m		< 50%			

Total Score: 28



Form A – Fish Passage Culvert Inspection – Side 1

Date (mm/dd/yy)	08/30/04	Stream Name	Unnamed
Road name/ID #	CP 630-4 Spur	Road Location (MoF District)	Skeena / Stikine
UTM/GPS Location	E 644112 / N 6159914	Watershed Code	480-
1:20 000 Map Sheet	093M.057	Recorder's Name	REK / HZ
Site Number	10		

Culvert

Pipe is flat. Watercourse is dry. No water flowing through pipe.

Characteristics:

Culvert Diameter (mm)	600	Culvert Elev. (m)	U/s	2.50	D/s	2.48	Slope (%)	0.2
Culvert Length (m)	10.5	High Water Mark (cm)	21 in / 15 out					
Culvert Material	Steel	Culvert Water Depth (cm)	10 in / 2 out					
Culvert Water Velocity (m/sec)	-	Culvert Outfall Drop (cm)	0 – flush					
Culvert Shape	Round	Culvert Inflow Drop (cm)	-					
Culvert Embedded (yes/no)	No – flush	Depth Embedded	Inlet (cm)	-	Outlet (cm)	0		
Culvert Wetted Width (cm)	41 in / 22 out	Culvert Maintenance (Hi/Mod/L/No)	No					
Coefficient of Roughness	.018	Fill Slope Depth (m)	U/S	0.22	D/S	0.20		

Stream

Watercourse is very flat (1% gradient). BM 100% organic. Marginal stream linked to wetland and known fish bearing stream.

Characteristics:

Stream Reach	1	Stream Classification	S4				
Pool Depth at Outfall (cm)	5	S1 S2 S3 S4 S5 S6 P					
Sediment Source/Degree	Road runoff, very low	Blue Listed / Significant Spp.	-				
Measure	Measurement(s) below culvert			Measurement(s) above culvert			Average Measurement
Wetted Width (m)	0	0	0	0	0	0	0
Bankfull Width (m)	.74	.71	.67	.62	.79	.42	.66
Water Depth (cm) .25 of width	0	0	0	0	0	0	0
Water Depth (cm) .5 of width	0	0	0	0	0	0	0
Water Depth (cm) .75 of width	0	0	0	0	0	0	0
Bankfull Depth (cm)	28	24	21	17	26	20	.23
Stream Water Velocity (m/sec)	-	-	-	-	-	-	-
Average Stream Gradient (%)	1			1			1
Maximum Stream Gradient (%)	1			1			1
Length of Maximum Grade (m)	25			25			N/A
Coefficient of Roughness	.04			.04			N/A
Fish Presence - yes, no, no survey	Yes			Yes			N/A
Fish Sampling Method	-			-			N/A
Sampling Effort (time)	-			-			N/A
Species Present	RB			RB			N/A
Beaver Activity/Type	No			No			N/A

Barrier Evaluation:

Barrier – Full/Partial/None/Undetermined:	None
Barrier Type:	---

Site Photos:

Roll #:	REK 12		
Inlet upstream photo:	19	Inlet downstream photo:	20
Outlet upstream photo:	18	Outlet downstream photo:	17

Site 630-4 - 10
Form A – Fish Passage – Culvert Inspection – Side 2

Comments:

Office Calculations: (*to be completed for full and partial barriers only)

Q100 Diameter Estimate (mm)	600	Stream Length Above Barrier (m)	250 m above crossing
Road Responsibility		% Stream Barred	

Prioritization Calculations – FPCI Scoring Matrix:

Fish Species		Habitat Value		Barrier		Length of New Habitat		Stream Barred (%)		Limiting to Upstream Barrier	
										Yes	
Multiple or Significant		H		Full		≥ 1 km		> 70%		Yes	
Single	6	M	7	Partial		< 1 km ≥ 500 m		≥50-70%		No	0
Other		L		Undeter	0	< 500 m	0	< 50%	0		

Total Score: 13



Form B – FPCI Summary Table Babine River Watershed

Fish Passage – Culvert Inspection Summary Table

Priority Rank	Score	Road	Site Number	Barrier	Stream Length Gained (m)	% Stream Barred	X-Reference Site Number(s)	FIA Eligible
1	41(H)	457	14	Partial	9000	82	---	Yes
2	40(H)	456	40	Partial	2500	57	---	Yes
3	39(H)	457	6	Partial	4800	65	---	Yes
4	37(M)	454A	4	Partial	850	89	---	Yes
5	36(M)	454B	9	Partial	2200	40	---	Yes
6	28(M)	465	31	None	5600	56	---	Yes
7	25(L)	457F	4	Partial	1000	50	457-74	Yes
8	24(L)	457	28	Partial	900	60	---	Yes
9	20(L)	457	74	Partial	500	40	457F-4	Yes
10	19(L)	454B	11	Partial	600	15	---	Yes
11	0	457	48	None	300	0	---	---
12	0	630-4	10	None	250	0	---	---

Form C – Other Priority Culvert Crossings Summary Babine River Watershed

Other Priority Culvert Crossings Summary Table

Priority Rating	Site Number	Maintenance Issues	Sediment Source	Notes
*				

* No Other Priority Culvert Crossings in the Babine Watershed Area.

**Form D – Sites not Assessed Summary Table
Babine River Watershed**

Site Number	Assessment	Notes
<u>454A Rd.</u>		
A-1	x-drain	
A-2	x-drain	
A-10	Non-Fish Bearing	
<u>454B Rd.</u>		
A-1	x-drain	
A-2	x-drain	
A-3	x-drain	
A-4	x-drain	
A-5	x-drain	
A-6	x-drain	
A-7	x-drain	
A-8	x-drain	
A-10	deactivated	
<u>456 Rd.</u>		
1	x-drain	Outlet plugged
2	Non-Classified Drainage	
3	x-drain	
4	x-drain	
5	Non-Classified Drainage	NVC d/s of xing
6	Non-Fish Bearing	
7	x-drain	
8	Non-Fish Bearing	
9	Non-Classified Drainage	
10	x-drain	
11	x-drain	
12	Non-Fish Bearing	
13	Non Fish Bearing	Same stream as 12
15	x-drain	
16	x-drain	
17	x-drain	Buried on u/s side
18	Non-Classified Drainage	
19	Non-Fish Bearing	
20	Non-Classified Drainage	
21	x-drain	Crushed inlet
22	x-drain	
23	x-drain	
24	x-drain	
25	x-drain	
26	x-drain	
27	x-drain	
28	x-drain	
29	x-drain	
30	x-drain	

Form D – Sites not Assessed Summary Table Babine River Watershed

Site Number	Assessment	Notes
<u>456 Road</u>		
31	x-drain	Crushed
32	x-drain	
33	x-drain	
34	x-drain	Crushed inlet
35	x-drain	
36	Non-Fish Bearing	
37	x-drain	
38	x-drain	
39	x-drain	
41	x-drain	
42	x-drain	
43	x-drain	
44	x-drain	
45	x-drain	
46	x-drain	
47	x-drain	
48	x-drain	
49	Non-Fish Bearing	
50	x-drain	
51	x-drain	
52	Non-Classified Drainage	
53	Non-Fish Bearing	
54	x-drain	
55	x-drain	
56	x-drain/ Non-Classified Drainage	
<u>456A Rd.</u>		
	Completely Deactivated	
<u>456B Rd.</u>		
	Completely Deactivated	
<u>456C Rd.</u>		
1	x-drain	
2	x-drain/ Non-Classified Drainage	
3	x-drain	
4	x-drain	
5	Non-Classified Drainage	
6	x-drain	
7	x-drain	
8	x-drain	
<u>456D Rd.</u>		
1	Non-Classified Drainage	
2	x-drain	
3	Non-Classified Drainage	
4	x-drain	

**Form D – Sites not Assessed Summary Table
Babine River Watershed**

Site Number	Assessment	Notes
<u>457 Rd.</u>		
1	Non-Classified Drainage	
2	Non-Classified Drainage	
3	Non-Classified Drainage	
4	x-drain	
5	Non-Classified Drainage	
7	Non-Classified Drainage	NCD on upstream side
8	x-drain	
9	x-drain	
10	x-drain	
11	x-drain	
12	x-drain	
13	x-drain	
15	x-drain	
16	Non-Fish Bearing	
17	x-drain	
18	x-drain	
19	x-drain	
20	x-drain	
21	x-drain/ Non-Classified Drainage	
22	x-drain/ Non-Classified Drainage	
23	x-drain	
24	x-drain	
25	x-drain	
26	Non-Classified Drainage d/s	
27	x-drain	Buried on upstream side
28	Non-Fish Bearing	
29	x-drain	
30	Non-Fish Bearing	
31	x-drain	
32	x-drain	
33	x-drain	
34	Non-Fish Bearing	
35	x-drain	
36	x-drain	
37	x-drain	
38	x-drain	
39	Non-Classified Drainage	
40	x-drain	
41	Non-Classified Drainage	
42	x-drain/ Non-Classified Drainage	
43	x-drain	
44	x-drain	
45	x-drain	
46	Non-Classified Drainage	
47	x-drain	
50	x-drain	

Form D – Sites not Assessed Summary Table Babine River Watershed

Site Number	Assessment	Notes
<u>457 Rd. continued</u>		
51	x-drain	
52	x-drain	
53	x-drain	
54	x-drain/ Non-Classified Drainage	
55	Non-Classified Drainage	
56	x-drain	
57	x-drain	
58	x-drain	
59	x-drain	
60	x-drain	
61	x-drain	
63	x-drain	
64	x-drain	
65	x-drain	
66	x-drain	
67	x-drain	
68	x-drain	
69	Non-Classified Drainage	
70	x-drain	
71	x-drain	
72	x-drain	
73	x-drain	
75	x-drain	
76	x-drain	
<u>457A Rd.</u>	Completely Deactivated	
<u>457B Rd.</u>	Completely Deactivated	
<u>457C Rd.</u>	Completely Deactivated	
<u>457D Rd.</u>	Completely Deactivated	
<u>457E Rd.</u>	Completely Deactivated	
<u>457F Rd.</u>	Completely Deactivated	
1	x-drain	
2	x-drain	
3	Non-Classified Drainage	

Form D – Sites not Assessed Summary Table Babine River Watershed

Site Number	Assessment	Notes
<u>465 Rd.</u>		
18	Non-Classified Drainage	
30	Non-Classified Drainage	
32	Non-Classified Drainage	
33	Non-Classified Drainage	
34	Non-Classified Drainage	
<u>632-2 Spur</u>		
19	Non-Fish Bearing	Same stream as 632-5 Site 10
<u>632-5 Spur</u>		
10	Non-Fish Bearing	Same stream as 632-2 Site 19

TAB 3 APPENDIX 3

**NILKITKWA RIVER WATERSHED and BABINE RIVER
WATERSHED MAPS**