

Smithers, British Columbia

# Davidson Environmental Assessment Fish Habitat Addendum Report



Prepared by: Rescan<sup>™</sup> Environmental Services Ltd. Vancouver, British Columbia



# DAVIDSON PROJECT Environmental Assessment: Fish Habitat Addendum Report

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**Prepared for:** 



Prepared by:



Rescan<sup>™</sup> Environmental Services Ltd. Vancouver, British Columbia



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# 1. Introduction

This report describes baseline studies of fish habitat conducted in the Davidson Project (the Project) area in 2007 and 2008. The objectives of these studies were to 1) assess fish habitat and classify watercourses along the proposed northern haul road, and 2) evaluate fish presence and habitat quality at the proposed diffuser site in the Bulkley River. This report is an addendum to previous aquatic resources baseline reports (Rescan 2007; Rescan 2006) for the Project.

# 2. STREAM CROSSING HABITAT ASSESSMENT ALONG THE PROPOSED NORTHERN HAUL ROAD



# 2. Stream Crossing Habitat Assessment along the Proposed Northern Haul Road

# 2.1 Fish Habitat Assessment Methods

Surveys of fish habitat were conducted according to the Reconnaissance 1:20,000 Fish and Fish Habitat Inventory: Standards and Procedures (RISC 2001). Stream reach classifications were assigned based upon the Riparian Management Area Guidebook (BC Ministry of Forests 1995) and Fish Stream Identification Guidebook (BC MOF 1998). A detailed evaluation of fish habitat was conducted at each proposed stream crossing (Table 2-1) to characterize channel morphology, stream features, stream flow, and overall habitat quality. Watercourses crossing the proposed northern haul road route were surveyed in August or October, 2007. Crews walked the proposed road route and classified the mapped drainages. Drainages and watercourses were classified as streams if they had a continuous, defined channel for at least 100 m with evidence of mineral substrate and alluvial scour. Watercourses with partial or discontinuous channelization were categorized as "non-classified drainages" (NCDs) and were not considered fish habitat. Sites where water seeped overland or pooled at the proposed road crossing without channelization or no evidence of water flow was found, were classified as "no visible channel" (NVC). NCD and NVC sites were noted, upstream and downstream photos were taken and GPS coordinates were recorded.

Stream crossings were sampled with electrofishing gear to determine the presence or absence of fish, species diversity, and the extent of fish use. Electrofishing was initially conducted within a 100 m section of the proposed stream crossing site and, if no fish were caught, sampling continued up and downstream for several hundred meters until either a fish was captured or a barrier to fish passage was encountered (RISC 2001; BC MOF 1998). Fish-bearing classifications of sampled reaches were based upon the connectivity of the watercourse to fish-bearing waterbodies, stream morphology, habitat quality, and the total amount and efficiency of fishing effort exerted on the stream. Captured fish were identified to species, measured, weighed, and released at the capture site. At sites with an average channel width greater than 3.0 m, additional information and photos were gathered to determine the navigability of each stream.

# 2.2 Results

Definitions used in the presentation of fish habitat data are shown in Appendix 2-1. Fish habitat data for each station are presented in Appendix 2-2, and stream morphology data are listed in Appendix 2-3. Fish habitat site cards and photographs are presented in Appendix 2-4. Fish species presence and fish habitat use are displayed in Figure 2-1.

# 2.2.1 Stream Crossing 1 – Lower Toboggan Creek

Fish habitat was surveyed at Toboggan Creek just upstream of the railway crossing. This reach of Toboggan Creek was classified as S2 with a 6 to 8 m wide channel and confirmed fish-bearing status. The stream was 7 m average channel width and a 6 m average wetted width, with an

		UTM L	ocation	E	FU		
Stream	Stream Crossing #	Easting	Northing	Easting	Northing	Fish-bearing (Y/N)	Stream Class
Lower Toboggan Creek	1	611473	6082731	u	l/s	Y	S2
Toboggan Creek Tributary 1	2	610952	6082516	u	l/s	Y	S3
unnamed	NCD 1	610920	6082424	_	-	Ν	NCD
Toboggan Creek Tributary 2	3	610727	6081825	u	l/s	Y	S3
Toboggan Creek Tributary 3	4	610941	6081241	611045	6081180	Ν	S6 u/s, S4 d/s
unnamed	-	611243	6080090	_	-	-	NVC
Toboggan Creek Tributary 4	5	611205	6079900	100 m d	l/s of site	Ν	S6
Toboggan Creek Tributary 5	6	611199	6079831	_	-	Y	S4
Upper Toboggan Creek	7	611000	6079383	_	-	Y	S2
Glacier Gulch Tributary 2	NCD 2	611600	6078550	_	_	Ν	NCD
Glacier Gulch Tributary 1	8	611578	6078535	_	-	Y	S4
Glacier Gulch Creek	9	611850	6076100	_	_	Y	S2
Club Creek	10	611964	6077631	_	-	Y	S3
unnamed	-	612020	6077364	_	-	-	NVC

Table 2-1Watercourses Crossing the Proposed Northern Haul Road, Davidson Project, 2007

Dashes indicate no data collected.

NVC = no visible channel; NCD = non-classified drainage

u/s = upstream, d/s = downstream



BLUE PEARL MINING

Watercourses Crossing the Proposed Northern Haul Road, Davidson Project, 2007



average gradient of 1.5%. Cover for fish was abundant, consisting of overhanging vegetation (dominant), undercut banks, and deep pools (sub-dominant), with woody debris and a trace amount of in-stream vegetation. Stream morphology was riffle-pool with bed materials consisting of gravel (dominant) and fine sediment (sub-dominant). Habitat for all fish life stages (e.g., rearing, spawning, and overwintering) were rated as good. Rearing habitat was provided by deep pools and runs with abundant cover. Spawning habitat for salmonids was provided by gravel in the tailouts of pools and overwintering habitat was provided by deep pools. Overall, the habitat at and adjacent to the proposed crossing was categorized as critical spawning habitat. Subsequent observations in October 2007 confirmed the presence of spawning coho salmon (*Oncorhynchus kisutch*) using this reach from the existing wooden bridge (situated 50 m upstream of the proposed crossing) and downstream for 150 m.

#### 2.2.2 Stream Crossing 2 – Toboggan Creek Tributary 1

This watercourse was previously assessed in 2006 as Station TC4 (see Rescan 2007, Appendix 3.2-8, Site 6). This reach was classified as S3 (1.6 m average channel width, fishbearing). Rearing habitat was good due to the presence of abundant cover. Spawning and overwintering habitat were poor due to lack of suitable substrates and deep pools, respectively. This stream reach may also be vulnerable to warming in the summer (17°C at time of survey in August of 2006). Cover for fish was abundant, consisting of overhanging vegetation (dominant), small woody debris and undercut banks (sub-dominant). Stream morphology was classified as riffle-pool, with a 0.8% gradient, and fine materials (dominant) and gravel (sub-dominant) composing the bed material. Cutthroat and rainbow trout were captured from this reach in 2006, and the site also has good potential to support coho salmon rearing. Fish habitat at this site was examined briefly in 2007 and no changes from the original habitat assessment were apparent.

#### 2.2.3 Stream Crossing 3 – Toboggan Creek Tributary 2

Fish habitat was assessed at stream crossing site 3, a tributary of Toboggan Creek. This tributary stream was classified as S3 with 2.4 m average channel width and confirmed fish presence. Stream morphological measurements included an average channel width of 2.4 m, average wetted width of 1.5 m, and average gradient of 7.5%. Stream morphology was riffle-pool with bed materials consisting of gravel (dominant) and fine sediment (sub-dominant). Cover for fish was abundant, consisting of overhanging vegetation (dominant), small and large woody debris (both sub-dominant), and undercut banks (trace). Rearing habitat for fish was fair, with abundant overhanging vegetation, and small and large woody debris in shallow pools. Spawning habitat was fair for resident Dolly Varden (*Salvelinus malma*) and cutthroat trout (*Oncorhynchus clarki*) due to small, pea-size gravel substrate. Spawning habitat was not suitable for adult, anadromous salmonids due to the lack of holding areas and depth. Overwintering habitat was poor due to shallow water depth. Overall, this stream crossing site was rated as important habitat. Two fry, either rainbow (*Oncorhynchus mykiss*) or cutthroat trout, were captured at this site in 184 seconds of electrofishing. The presence of young-of-the-year trout indicate that adult trout likely utilize this stream reach as spawning habitat.

# 2.2.4 Stream Crossing 4 – Toboggan Creek Tributary 3

A third Toboggan Creek tributary was assessed at stream crossing site 4. Reach 2 is upstream of the crossing and was classified as S6 with 1.3 m channel width. No fish were captured by electrofishing. Reach 1, immediately downstream of the crossing, was classified as S4 and fishbearing. Average morphological measurements of the S6 reach included a 1.3 m channel depth, a 1.1 m wetted depth, and a gradient of 3.5%. The stream morphology was riffle-pool with substrate consisting of gravel (dominant) and fines (sub-dominant). Cover for fish was moderate, consisting of small woody debris (dominant), large woody debris, undercut banks, overhanging vegetation (all sub-dominant), and in-stream vegetation (trace). Rearing habitat was fair due to the abundance of cover. Spawning habitat was fair, with occasional patches of gravel; however, fine silt and sand was observed in this stream. Overwintering habitat was poor due to a lack of pools greater than 0.5 to 1 m in depth. Overall, habitat at this site was rated as important. Although fish habitat was important, this stream crossing location was found to be non-fish-bearing due to a 1.4 m chute and 0.75 m cascade located at the proposed crossing site, representing the end-of-fish-use (EFU) and a reach break for this stream (Figure 2-1). No fish were captured upstream of this EFU at the stream crossing site in 536 seconds of electrofishing, but fish have access into Reach 1 of this tributary from Toboggan Creek.

# 2.2.5 Stream Crossing 5 – Toboggan Creek Tributary 4

A fourth tributary of Toboggan Creek was assessed at stream crossing 5. This stream was classified as S6 (average channel width 1.2 m, non-fish-bearing). Stream morphology was rifflepool with fines as the dominant substrate material. Average channel width, wetted width, and gradient was 1.2 m, 0.84 m, and 3%, respectively. Cover for fish was abundant, consisting of overhanging vegetation (dominant), small woody debris and large woody debris (sub-dominant), and undercut banks (trace). Rearing habitat was very poor because pools were not present and the stream was nearly dry. The channel was intermittent upstream of the proposed crossing. No spawning or overwintering habitat was present in this short ephemeral channel. Overall, fish habitat was rated as marginal due to the lack of physical features required by fish. No fish were captured in 203 seconds of electroshocking. Approximately 100 m downstream of this site, the stream disperses across the floodplain and lacked a defined channel. Fish access was not possible from Toboggan Creek (Figure 2-1).

# 2.2.6 Stream Crossing 6 – Toboggan Creek Tributary 5

Fish habitat was assessed at a fifth tributary of Toboggan Creek - stream crossing 6. This stream was classified as S4 (fish-bearing with 1.8 m average channel width). Stream morphology was riffle-pool with substrate consisting of gravel (dominant) and fines (sub-dominant). Average channel width, wetted width, and gradient measured 1.8 m, 1.3 m, and 3.5%, respectively. Cover for fish was moderate, consisting of overhanging vegetation (dominant), large and small woody debris (sub-dominant), and undercut banks (trace). Rearing habitat was fair due to the overhanging cover, but the channel lacked pools as habitat for juvenile fish. Spawning and overwintering habitat was poor due to the lack of gravel substrate and deep pools, respectively. Overall, fish habitat at this site was categorized as marginal. Dolly Varden and a young-of-the-

year of an unidentified species (likely cutthroat trout) were captured by electrofishing. Fish access to the crossing area from Toboggan Creek is possible.

# 2.2.7 Stream Crossing 7 – Upper Toboggan Creek

A second crossing of the Toboggan Creek mainstem was assessed at stream crossing 7. This site is the existing ford along the Silvern Lakes access trail. The stream banks at the ford were riprapped and the site was examined from upstream of the ford and downstream for 150 m where it flows across an alluvial fan. This upper section of Toboggan Creek was classified as S2 (fish-bearing, 16 m average channel width). Stream morphology was cascade-pool with substrate consisting of cobble (dominant) and boulders (sub-dominant). Average stream morphological measurements included a 16 m channel width, 9.5 m wetted width, and 5.3% gradient. Cover for fish was moderate, consisting of boulders (dominant), large woody debris, and overhanging vegetation (sub-dominant), small woody debris and few deep pools. Rearing habitat was fair due to cover provided by sparse large woody debris and cobble; however, this section is a fast cascade with few plunge pools which is less preferred by juvenile fish. Spawning habitat was poor since boulders and cobble are the dominant substrate type, with only occasional gravel patches in the area. Overwintering habitat was poor because of the relatively shallow depth and fast flow. Overall, fish habitat was rated important because it is typical of the habitat along this alluvial fan reach.

# 2.2.8 Stream Crossing 8 – Glacier Gulch Creek Tributary 1

Fish habitat was assessed at stream crossing 8, a tributary of Glacier Gulch Creek. This tributary stream was classified as S4 (1.4 m average channel width and assumed fish-bearing due to access from the mainstem). Stream morphology was riffle-pool with gravel and fines comprising the dominant and sub-dominant substrate, respectively. Average stream morphological measurements included 1.4 m channel width, 1.3 m wetted width, and 4% gradient. Cover for fish was abundant, consisting of overhanging vegetation (dominant), large woody debris and undercut banks (sub-dominant), and small woody debris (trace). Rearing habitat for juvenile fish was fair because the stream had abundant cover but few pools deeper than 0.2 m. Spawning habitat was poor; however, small patches of fine gravel may be suitable for Dolly Varden. Overwintering habitat was poor because deep pools were not present. Overall, fish habitat was categorized as marginal.

# 2.2.9 Stream Crossing 9 – Glacier Gulch Creek

The mainstem of Glacier Gulch Creek was assessed at stream crossing 9 situated approximately 150 m upstream of the existing bridge made of an old rail car at the Silvern Lakes trail. Glacier Gulch Creek was classified as an S2 stream (known fish presence and 16.5 m average channel width). Stream morphology was categorized as cascade-pool with cobble and boulders representing the dominant and sub-dominant substrate, respectively. Cover for fish was moderate, consisting of boulders (dominant), overhanging vegetation and large woody debris (sub-dominant), and undercut banks (trace). Rearing habitat was fair due to the fast, cascading flow but it lacked deep pools. Spawning and overwintering habitat was not observed along this reach. Overall, fish habitat for spawning and overwintering was categorized as marginal; however, due to the presence of rearing habitat for Dolly Varden, habitat at this site may be important for juvenile fish rearing.

#### 2.2.10 Stream Crossing 10 – Club Creek

Fish habitat was assessed at the proposed crossing at Club Creek situated approximately 350 m uphill from the Silvern Lakes trail. Club Creek receives water from a diversion out of Glacier Gulch Creek approximately 50 m upstream of the proposed crossing. This reach was classified S3 (3.7 m average channel width, fish-bearing). Stream morphology was cascade-pool with cobble and boulders as the dominant and sub-dominant substrate, respectively. Average measurements included a 3.7 m channel width, 2.8 m wetted width, and 4.5% gradient. Cover for fish was moderate, consisting of overhanging vegetation (dominant), large woody debris, boulders, and undercut banks (sub-dominant). Rearing habitat was fair due to the moderate cover for juvenile fish. Overwintering habitat was poor due to the lack of deep pools and fast, cascading flow. Spawning habitat was not present at this site. Overall, fish habitat was categorized as marginal.

#### 2.2.11 Summary

In summary, ten crossing sites were assessed for fish habitat and classified as stream reaches, while two NCDs and one NVC were noted along the proposed northern haul road (Table 2-2). Of the classified crossings, eight were either confirmed or default fish-bearing reaches that provide marginal, important or potentially critical fish habitat (i.e., Lower Toboggan Creek crossing 1). The eight fish-bearing stream reaches were classified as S2 to S4, while two non-fish-bearing stream reaches were classified as S2 to S4, while two non-fish-bearing stream reaches were classified as S6. Overall, the larger (S2) streams provided important to potentially critical fish habitat, while the smaller (S4 to S6) reaches provided marginal fish habitat. The majority of streams provided fair to good rearing habitat, while spawning and overwintering habitat was generally poor to nonexistent at tributary stream sites. Spawning and overwintering habitat was also present in lower Toboggan Creek. Stream crossing 4 is crossed by the proposed road at the reach break between a downstream S4 reach and upstream S6 reach.

In addition, two NCDs and one NVC site were noted along the proposed route. The NVC site was a mapped drainage; however, a Hatch Engineering survey crew did not find a watercourse in the field near the proposed location. The two NCD sites were assessed by Rescan fisheries biologists at mapped drainages (Figure 2-1); however, they were discontinuous or seepage channels that did not contain fish habitat. Hatch crews found other seepages and NCDs along the proposed route but these were not assessed by Rescan fisheries biologist because they had no potential as defined reaches or fish habitat.

			Dav		10 jeci, 20	07				
	Stream	Fish-	Mean	Stream		Habitat F	Ratings		Fish Species	
Stream	Crossing #	bearing	Width (m)	Class	Overall	Spawning	Rearing	Overwintering	Composition	
Lower Toboggan Creek	1	Y	7	S2	Critical	G	G	G	spawning CO observed	
Toboggan Creek Tributary 1	2	Y	1.6	S3	Marginal	Р	G	Р	RB, CT, CO	
Toboggan Creek Tributary 2	3	Y	2.4	S3	Important	F (for resident species only)	F	Р	RB/CT	
Toboggan Creek Tributary 3	4	Ν	1.3	S6 u/s S4 d/s	Important	F	F	Р	-	
Toboggan Creek Tributary 4	5	Ν	1.2	S6	Marginal	Ν	Р	Ν	_	
Toboggan Creek Tributary 5	6	Y	1.8	S4	Marginal	Р	F	Р	DV, RB/CT	
Upper Toboggan Creek	7	Y	16	S2	Important	Р	F	Р	_	
Glacier Gulch Tributary 1	8	Y	1.4	S4	Marginal	Р	F	Р	-	
Glacier Gulch Creek	9	Y	16.5	S2	Marginal, possibly important	Ν	F	Ν	-	
Club Creek	10	Y	3.7	S3	Marginal	Ν	F	Р	_	

Table 2-2 Summary of Fish Habitat at Streams Crossing the Proposed Northern Haul Road, Davidson Project, 2007

Note: NCD and NVC sites not included due to lack of fish habitat.

NVC = no visible channel; NCD = non-classified drainage.

Fish Habitat Ratings: G = Good, F = Fair, P = Poor, N = None.

Fish Species Codes: CT = cutthroat trout, CO = coho salmon, DV = Dolly Varden, RB = rainbow trout

# 3. FISH HABITAT ASSESSMENT OF DIFFUSER SITE ON THE BULKLEY RIVER



# 3. Fish Habitat Assessment of Diffuser Site on the Bulkley River

A reconnaissance level fish habitat assessment and snorkel survey was conducted by Rescan fisheries biologists at the proposed diffuser location on the Bulkley River. The main objectives of the survey were to:

- describe physical habitat features (e.g., stream morphology, substrate, riparian vegetation, cover for fish) at the proposed diffuser site;
- evaluate habitat quality and suitability for various fish species and their life stages (e.g., spawning, rearing, and overwintering habitats, with emphasis on steelhead habitat requirements);
- observe steelhead utilizing the proposed diffuser site as overwintering habitat; and
- evaluate the presence of potentially critical fish habitat (e.g., spawning habitat).

This survey was conducted in the afternoon of November 13, 2008. The survey began approximately 400 m upstream of the existing Town of Smithers sewage outfall at a gravel bar on the left bank (Plate 3-1). Biologists floated downstream approximately 4 m and 8 m from the left bank, respectively. Underwater visibility was approximately 1 m, which was poor for viewing fish at a distance greater than 0.5 m. The snorkel survey terminated approximately 200 m downstream of the proposed diffuser site. River depth and flow was typical for the fall low-flow period.

The bankfull width along most of the snorkelled section was approximately 120 m and wetted width was approximately 110 m. The left bank was mostly vertical, composed of cobble, gravel, and sand (Plate 3-2). At the proposed diffuser site, the depth drops off sharply from the shoreline to approximately 1.2 m, then becomes gradually deeper. The depth at the deepest part of the thalweg is approximately 1.5 to 1.8 m. Depth in this section was estimated due to the swift flow. The right bank is mostly sloping, and is also composed of cobble, gravel, and sand. The river bottom slopes gently away from the right bank. The runs and pools up and downstream of the existing outfall were noted by a local guide as popular steelhead angling locations.

Substrate at the upstream portion of the snorkelled section was primarily cobble and gravel; however, large cobbles and boulders became the dominant substrate in the deeper section approximately 200 m upstream of the sewage outfall (Plate 3-3). The thalweg (i.e., main flow) was located along the left bank for most of the distance snorkelled, and flows in this area were relatively swift. Downstream of the sewage outfall, substrate became progressively larger; composed of approximately 60% large cobble and 40% boulder. Large boulders created occasional eddies downstream of the sewage outfall, but otherwise cover for fish was low throughout the reach.

The riparian vegetation on the left bank was dominated by sparse to dense patches of mature cottonwood and spruce trees between 10 and 20 m in height, with a sparse brush understory of red osier dogwood and berry bushes (Plate 3-4). On the right bank, a farmer's field comes right



Plate 3-1. Sample reach looking downstream from the start of the snorkel survey. The existing sewage outfall is located on the left of the photo, approximately 400 m downstream.



Plate 3-2. Proposed diffuser location (looking upstream). Note the steep bank and the coarse bank texture.



Plate 3-3. Cobble-boulder substrate near the proposed diffuser site. Photo taken approximately 3 m from the left bank of the river along the bed at the existing sewage outfall.



Plate 3-4. Left bank riparian vegetation, looking upstream from the end of the snorkel survey (approximately 300 m downstream of the existing sewage outfall).

to the river bank with a thin row of mature cottonwood trees lining the river bank. Further upstream, the right bank is dominated by mature spruce and pine trees.

Rearing habitat for juvenile fish was poor throughout this reach due to swift flow, large substrate and absence of cover. Anadromous steelhead and larger resident fish may use the deeper sections of this reach for holding during migration and possibly for overwintering. A local guide also indicated that winter steelhead hold in areas upstream and downstream of the sewage outfall and near the proposed diffuser site. Fish were not observed during the snorkel survey. Spawning habitat was not observed along the left bank; however, the right bank, which was not assessed in detail, may provide smaller substrates due to the reduced flow.



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# APPENDIX 2-1 FISH HABITAT INVENTORY DEFINITIONS, DAVIDSON PROJECT, 2007



# Appendix 2-1 Fish Habitat Inventory Definitions, Davidson Project, 2007

Cover:	SWD = small woody debris, LWD = large woody debris, B = boulders U = undercut banks, DP = deep pools, OV = overhanging vegetation, IV = instream vegetation AMT = amount, N = none, T = trace, S = sub-dominant, D = dominant LOC = location, P = primary channel, S = secondary channel, O = off channel A = all channels
Total cover:	N = none, T = trace, M = moderate, A = abundant
Functioning LWD:	Pres. = presence, N = none, F = few, A = abundant Dist. = distribution, C = clumped, E = even
Instream Vegetation:	V = vascular plants, M = mosses, A = algae, N = none
Bank Shape:	U = undercut banks, V = vertical, S = sloping, O = overhanging
Bank Texture:	F = fines, G = gravel, C = cobble, B = boulder, R = bedrock, A = anthropogenic
Riparian Vegetation:	N = none, G = grass, S = shrub, C = coniferous forest, D = deciduous forest M = mixed C & D forest, W = wetland
Vegetation Stage:	INIT = initial, SHR = shrub, PS = post-sapling, YF = young forest, MF = mature forest
Flood Signs:	MC = multiple channels, RD = rafted debris, BS = bed scour, VS = vegetation staining
D95:	The diameter of the bed material that is larger than 95% of the materials in the stream channel
D:	Represents the size of the largest particle on the channel bed that will be moved at channel forming flow levels
Disturbance Indicators:	O1 = beaver dam, B1 = abandoned channels, B2 = eroding banks, B3 = avulsions D1 = SWD, D2 = LWD, D3 = debris jams, C1 = extensive riffles or cascades, C2 = minimal pool area, C3 = elevated mid-channel bars, C4 = multiple channels or braids, C5 = disturbed stone lines, S1 = homogeneous bed texture S2 = sediment fingers, S3 = sediment wedges, S4 = extensive bars, S5 = extensively scoured zones
Pattern:	TM = tortuous meanders, ME = regular meanders, IM = irregular meandering IR = irregular wandering, SI = sinuous, ST = straight
Islands:	N = none, O = occasional, I = irregular, F = frequent, S = split, AN = anastomising
Bars:	N = none, SIDE = side bars, DIAG = mid-stream bars (diagonal), MID = mid-stream bars (parallel), SPAN = continuous along sides, BR = braided
Coupling:	DC = decoupled, PC = partially coupled, CO = coupled
Confinement:	EN = entrenched, CO = confined, FC = frequently confined, OC = occasionally confined, UN = unconfined

# APPENDIX 2-2 STREAM FISH HABITAT INVENTORY SUMMARY, PROPOSED NORTHERN HAUL ROAD, DAVIDSON PROJECT, 2007



	Appendix 2-2	
Stream Fish Habitat Inventory Summary	, Proposed Northern Haul Road,	Davidson Project, 2007

	Stream							Co	ver									Function	ing	
	Crossing	SV	VD	LV	VD	I	3	l	J	D	P	0	v	ľ	v	Total	Crown	LWD		Inst.
Site Name	#	AMT	LOC	Cover	Closure	Pres.	Dist.	Veg												
Lower Toboggan Creek	1	Т	Р	Т	Р	Ν	-	SD	Р	SD	Р	D	Р	Т	Р	Ab	21-40%	Functioning	-	Veg
Toboggan Creek Tributary 1	2	SD	Р	N	-	Ν	-	SD	Р	Ν	-	D	Р	N	-	Ab	21-40%	N	-	Ν
Toboggan Creek Tributary 2	3	SD	Р	SD	Р	Ν	-	Т	Р	Ν	-	D	Р	N	-	Ab	> 90%	А	С	Ν
Toboggan Creek Tributary 3	4	D	Р	SD	Р	Ν	-	SD	Р	Ν	-	SD	Р	Т	Р	Μ	71-90%	A	E	Μ
Toboggan Creek Tributary 4	5	SD	Р	SD	Р	Ν	-	Т	Р	Ν	-	D	Р	N	-	Ab	1-20%	А	Е	Ν
Toboggan Creek Tributary 5	6	SD	Р	SD	Р	Ν	-	Т	Р	Ν	-	D	Р	N	-	М	41-70%	А	С	Μ
Upper Toboggan Creek	7	Т	Р	SD	Р	D	Р	Ν	-	Т	Р	SD	Р	N	-	М	1-20%	Functioning	С	Ν
Glacier Gulch Tributary 1	8	Т	Р	SD	Р	Ν	-	SD	Р	Ν	-	D	Р	N	-	Ab	41-70%	Functioning	Е	Μ
Glacier Gulch Creek	9	N	-	SD	Р	D	Р	Т	Р	Ν	-	SD	Р	N	-	М	1-20%	А	С	Ν
Club Creek	10	Ν	-	SD	Р	SD	Р	SD	Р	Ν	-	D	Р	Ν	-	М	-	Functioning	Е	-
Dashes indicate data were not colle	cted.																		(C	ontinued)

LB = left bank, RB = right bank. n/a = not applicable.

		Appendix 2-2				
Stream Fish Habitat Inventory	y Summary, Pro	posed Northern	Haul Road,	Davidson Pro	ject, 2007	(continued)

	Stream					Ripa	arian	Vege	tation									
	Crossing	Ba	ank	Bank	texture	Vege	tation	Sta	age					Flood	Bed	Material	D95	D
Site Name	#	LB	RB	LB	RB	LB	RB	LB	RB	Temp.	pН	Cond.	Turb.	signs	Dominant	Subdominant	(cm)	(cm)
Lower Toboggan Creek	1	U	U	F,G	F,G	D	С	PS	PS	-	-	-	L	Flood plain for 40+m on either side	Gr	F	10	3
Toboggan Creek Tributary 1	2	U	S	F,G	F,G	Μ	Μ	MF	MF	17	7.7	130	С	-	F	Gr	1	1
Toboggan Creek Tributary 2	3	V	S	F,G	F,G	D	D	PS	PS	5	7.8	100	С	Rafted debris	Gr	F	15	5
Toboggan Creek Tributary 3	4	U	S	F	F	Μ	Μ	MF	MF	6	7.6	110	С	-	Gr	F	25	2
Toboggan Creek Tributary 4	5	S	S	F	F	S	S	NA	SHR	6	7.8	110	С	-	F	-	5	<1
Toboggan Creek Tributary 5	6	V	S	F	F	S,M	Μ	YF	YF	6	7.8	120	С	-	Gr	F	10	2
Upper Toboggan Creek	7	S	S	F,G,C	F,G,C	Μ	Μ	MF	MF	-	-	-	С	Silt and channel erosion	Cb	В	-	-
Glacier Gulch Tributary 1	8	S	S	F	F	Μ	Μ	MF	MF	-	-	-	С	-	Gr	F	15	1
Glacier Gulch Creek	9	V	V	F,G,C,B	F,G,C,B	Μ	Μ	PS,YF	PS,YF	-	-	-	L	Overbank cobble deposits	Cb	В	-	-
Club Creek	10	S	U	F,G,C	F,C	С	С	YF	YF	-	-	-	L	Alluvial fan	Cb	В	-	-
Dashes indicate data were not colle	ected.																(C	ontinued)
LB = left bank, RB = right bank. n/a = not applicable.																		

Appendix 2-2 Stream Fish Habitat Inventory Summary, Proposed Northern Haul Road, Davidson Project, 2007 (completed)

	Stream Crossing	Disturbance					
Site Name	#	Indicators	Pattern	Islands	Bars	Coupling	Confinement
Lower Toboggan Creek	1	-	IR	N	SIDE	DC	UN
Toboggan Creek Tributary 1	2	-	SI	N	SIDE	DC	OC
Toboggan Creek Tributary 2	3	-	SI	N	SIDE	DC	UN
Toboggan Creek Tributary 3	4	-	SI	Ν	N	DC	FC
Toboggan Creek Tributary 4	5	-	SI	N	N	DC	UN
Toboggan Creek Tributary 5	6	-	SI	N	N	DC	OC
Upper Toboggan Creek	7	B1, B2, B3, D3, C3, S3	SI	N	SIDE, DIAG, MID	PC	FC
Glacier Gulch Tributary 1	8	-	SI	N	N	DC	OC
Glacier Gulch Creek	9	-	SI	N	SIDE, DIAG, MID, SPAN	PC	EC
Club Creek	10	B3	ST	N	Ν	DC	OC

Dashes indicate data were not collected.

LB = left bank, RB = right bank. n/a = not applicable.

# APPENDIX 2-3 STREAM CHANNEL MORPHOLOGY SUMMARY, PROPOSED NORTHERN HAUL ROAD, DAVIDSON PROJECT, 2007



# Appendix 2-3 Stream Channel Morphology Summary, Proposed Northern Haul Road, Davidson Project, 2007

		Channel	Width (m)	Wetted	Residual Pool	Gradient
	Stream	Bankfull	Wetted	Depth (m)	Depth (m)	(%)
Site Name	Crossing #	Mean ± SE	Mean ± SE	Mean ± SE	Mean ± SE	Mean ± SE
Lower Toboggan Creek	1	7 ± 1.0	6 ± 1.0	1 ± 0	-	1.5 ± 0.5
Toboggan Creek Tributary 1	2	$1.6 \pm 0.09$	$1.4 \pm 0.06$	$0.3 \pm 0$	0.11 ± 0.02	$0.75 \pm 0.3$
Toboggan Creek Tributary 2	3	$2.4 \pm 0.2$	1.5 ± 0.1	0.35 ± 0.05	$0.09 \pm 0.02$	7.5 ± 2.5
Toboggan Creek Tributary 3	4	1.3 ± 0.1	1.1 ± 0.1	$0.4 \pm 0.06$	0.15 ± 0.02	$3.5 \pm 0.5$
Toboggan Creek Tributary 4	5	1.2 ± 0.2	0.8 ± 0.1	0.18 ± 0.03	$0.06 \pm 0$	3 ± 1
Toboggan Creek Tributary 5	6	1.8 ± 0.2	$1.3 \pm 0.1$	0.28 ±0.02	0.17 ± 0.02	$3.5 \pm 0.5$
Upper Toboggan Creek	7	16 ± 1.0	9.5 ± 1.5	1 ± 0	$0.66 \pm 0.06$	5.3 ± 1.1
Glacier Gulch Tributary 1	8	$1.4 \pm 0.2$	$1.3 \pm 0.2$	0.25 ± 0.03	-	4 ± 1
Glacier Gulch Creek	9	16.5 ± 1.5	6 ± 1.0	1.15 ± 0.05	-	$4.5 \pm 0.6$
Club Creek	10	$3.7 \pm 0.9$	$2.8 \pm 0.3$	0.73 ± 0.18	-	$4.5 \pm 0.5$

SE: Standard error of the mean.

Dashes indicate data not avaiable.

# APPENDIX 2-4 FISH HABITAT SITE CARDS AND PHOTOGRAPHS, DAVIDSON PROJECT, 2007



					Reach #	ILP Map #	ILP #	Site
Watershed Code: 000-000	00-0000-00	000-0000-0000-000	-000-000-000-00	00-000	.1	093L.084	99	1
			PRO	JECT				
Project Name:	Davidson							
Stream Name (gaz.):	TOBOGGA	N CREEK			P	roject Code:	18755	
Project Watershed Code:	460-242900	0-0000-00000-0000	-0000-000-000-0	00-000-000-00	0			
			WATE	RSHED				
Gazetted Name:					Local Name	: Site 1, 0+488? M alig	Inment	
Watershed Code: 000-000	000-00000-00	000-0000-0000-000	-000-000-000-00	00-000				
ILP Map#: 093L.084	4	ILP #: 99 I	VID Map #:	NI	ID #:	Reach #:	.1 S	Site #: 1
Field UTM (Z.E.N): 9.61147;	3.6082731	Method: G	P3		Site La: 150	Method: GE	Acces	s: V2
GIS UTM (Z.E.N):				Re	ef. Name:			
							_	_
Date: 2007/	08/02	Time: 12:15	Agency: C	660 C	crew: SJ GN	Fish Crd?	: 🗌 Ind	complete: 🔽
			СНА	NNEL				
Mtd	width width	h width width	width width	width width	width width	Avg	Gadient %	Mtd Avg
Channel Width (m): GE 6	6.00 8.00					7.00 Method I:	2.0 1.0	GE 1.50
Wetted Width (m): GE	5.00 7.00	)				6.00 Method II:		
Pool Depth (m):						0.00		
Wh Depth: 10		Ava: 1.00	Method: C	20 94	200: L 🗔 M [		.: Intermit	tent:
		Avg. 1.00	Method. C				v II	ibs
COVER	Т	otal: A			_			
Type: SWD	LWD	B U	DP O	V IV	CROWN CL	OSURE		
Amount: T	Т	N S	S D	Т	2 21	-40%		
Loc: P/S/O:					INSTREAM	VEG: N A	M 🗌 V 🔽	
		DIST: C			_			
	0 - 0 -		_		RB SHP:	U 	<u> </u>	• —
l exture: F					l'exture:		вПКП	A
RIP: D					RIP:	С		
STG: PS					STG:	PS		
			WA	TER				
EMS:					Reg #:			
Temp:			Method:		Cond.:		Meth	iod:
pH:			Method:		Turk T		Acth	
Flood Signs: 40+m eit	herside		Method: GE		TUID T		Inter	IOU. GE
			MORPH	101067				
					O1 B1		2 03	
Bed Material: Do	ominant: G	Subdom:	F					
D95: 10.0	D (cm): 3.0	0 Morph:	RP DIS	STURBANCE				
Pattern: IR			II	DICATORS	C1 C2	C3 C4 C5 S	51 S2 S3	S4 S5
Islands: N								
Coupling: DC								
Confinement: UN				Deres				
FSZ:				Bars:	N SIDE			
A1			HADITAI	QUALII	• • • • • • • •			
Name	habitat act-	ioni Important	ntially aritical if !					
Ouner OverWinter Habitat		pools and deep addi	nuality critical If I	CIUWII OF ODSEF	veu spawn site			
Spawning Habitat	Good - nice	aravel/sand in tailout	s and runs					
Rearing Habitat	Good - Ints o	of cover, deen nools	and shallow runs	with abundant	coho frv. anod u	ndercut banks		
			PHO	DTOS	, good d			
Dhota		Dir	1			Commonto		
P1010 F00	LY		Photos 6109 t	n 6111 Tobogr	nan ok at rail oros	sing with lots of fry and	and snawning	n gravel
	1	NO NO	1 10103 0100 0		you on at rall 0108	ong munoto or ny drit	. good spawning	9 9 4 4 6

				Reach #	ILP Map #	ILP #	Site				
Watershed Cod	e: 000-000000-00000-	00000-0000-0000-00	00-000-000-000-000	.1	093L.084	99	1				
			PHOTOS								
Photo	Foc Lg	Dir		C	omments						
R: 6112 F: 6121	6121 NS photos 6112 to 6121 pink crossing at 20 to 30m upstream proposed alignment cast approac views.										
			COMMENTS								
Section			(	Comments							
CHANNEL	checked no	orth approach for FS2	Z - just one channel - see drawir	g							
CHANNEL key is to put wingwalls with lock block to minimize footprint and also put food peller culverts											
CHANNEL	18m span	= 16m clear = 4m rip	arian vegetation preserved eithe	r site of channel ec	lge						
SITE CARD	Not specifi	ed if LWD was Clum	ped or Evenly distributed								
SITE CARD											

Site 1



Plate 1. Toboggan Creek, upstream of existing railroad bridge.



Plate 3. Dominant gravel substrate at Toboggan Creek, Site 1.



Plate 2. Toboggan Creek, upstream view at proposed road crossing.



Plate 4. Glide habitat downstream of proposed crossing at Site 1.

						Reach # ILP Map # ILP # Site							
Watershed Code: 000-000	0000-0000	-0000-0000	-0000-00	0-000-0	000-000-	000-000		1.	0	C	93L.084	101	0 3
					PR	OJE	СТ						
Draig at Name													
Project Name	: Davidsor	AN CREEK	ć						F	Project Co	de:	1	18755
Project Watershed Code	e: 460-2429	00-00000-0	、 0000-000	0-0000-	-000-000	-000-00	0-000-0	00			uc.		10/00
					WAT	ERSI	HED						
Gazetted Name:								Lo	cal Name	e: Site 3,	1+724m, wp	t 006	
Watershed Code: 000-00	0000-00000	-00000-0000	)-0000-00	0-000-0	-000-000	000-000				_			
ILP Map#: 093L.08	84	ILP #: 10	010	NID M	ap #: 093	3L.084	N	IID #: 1		Reac	h #:	1.0	Site #: 3
Field UTM (Z.E.N): 9.61072	27.6041825	N	Nethod:	GP3			_	Site L	g: 200		Method: GI	S	Access: FT
GIS UTM (Z.E.N):							R	et. Name	9:				
Date: 2007	7/10/11	Time: 14	:30		Agency:	C660	(	Crew:	SJ		Fish Crd	?: 🖌	Incomplete: 🗹
					СН	ANN	EL						
Mtd	width wi	dth width	width	width	width	width	width	width	width	Avg		Gadier	nt % Mtd Avg
Channel Width (m): MS	3.40 2.1	0 2.50	2.00	2.30	2.20					2.42	Method	I: 5.0	10.0 C 7.50
Wetted Width (m): MS	1.20 1.	60 1.40	1.40	1.60	1.50					1.45	Method I	l:	
Pool Depth (m). MS	0.09 0.	05 0.07	0.16							0.09	No Vis.C	h.: 🗌 li	ntermittent:
Wb Depth: .3	.4	Av	g: 0.35	ſ	Method:	MS	S	tage: L	✓ M	ПНС	] [	)w: 🗌	Tribs.:
COVER		Total: A											
Type: SWD	D LWD	В	U	DF		OV	IV	CR	OWN CL	OSURE			
Amount: S	S	Ν	Т	N		D	Ν	5	;	>90%			
Loc: P/S/O:								] INS	STREAM	VEG:	N 🗌 A 🗌	M □ \	/
LWD: A		DIST: C											
LB SHP: V									RB SHP	: S			
Texture: F	G 🔽 C	ПВП	R 🗔 A						Texture	: F 🔽	G 🔽 C 🗆	] В []	
RIP: D									RIP	: D			
STG: PS									STG	: PS			
					w	ΔTF	R						
EMS <sup>.</sup>				-		<u> </u>		R	ea #	-			
Temp: 5				Meth	od: NS			C	ond.: 10	0			Method: NS
pH: 7.8				Meth	od: NS			1	Furb.: T	m M r			Method: GE
Flood Signs: rafted d	ebris at BFD	)		Meth	od: GE								
				N	IORP	HOL	OGY	,					
Bed Material:	Dominant: G		Subdom	: F				01	B1	B2 E	3 D1	D2 D3	
D95: 15.0	D (cm): 5	5.00	Morph	: RP	Г								
Pattern: SI					L	INDICA	TORS	C1	C2	C3 C	4 C5	S1 S2	S3 S4 S5
Islands: N													
Coupling: DC													
Confinement: UN						В	ars:	N	SID	E.			
FSZ:						_			]				
				ΗA	ΒΙΤΑ	ΤQU	JALI	ТΥ					
Name							(	Commer	its				
Other	Habitat Ca	tegory - Imp	ortant										
OverWinter Habitat	Poor - too	shallow	OT only	aanduu		al huta	a al far l	orao fiak		o holding			
Rearing Habitat	Fair - abur	idant overha	anging ve	getation	with sm	all shall	our ion i ow pools	s with LV	VD/SWD	cover	ai Ca3		
					PH	ΟΤΟ	S						
Photo Fo	oc Lg		Dir	Т						Commen	ts		
R: DIG F: 8386	-		X	card	1								
R: DIG F: 8389			Х	card	4								

							Reach #	ILP Map #	ILP #	Site				
	Wa	aters	hed Cod	e: 000-000000-000	00-0000-0000-0000-00	00-000-000-000-000	1.0	093L.084	1010	3				
						PHOTOS								
	Ph	oto		Foc Lg	Dir		C	omments						
R:	DIG	F	: 9084		U	LT. Bucket and brushy cha	annel							
R:	DIG	F	: 9185		D	LT. Channel with 100% ov	ervegetation and SJ							
R:	DIG	F	: 9282		X Gravel substrate									
COMMENTS														
		S	ection				Comments							
		СН	ANNEL	S3 clas	6									
		СН	ANNEL	tobogga	in creek - 225 m d/s									
		СН	ANNEL	recomm	end fix obstruction									
		СН	ANNEL	old spu	road makes partial obs	struction to prevent small fish fr	om ascending							
		СН	ANNEL	2 CT/RI	3T fry caught upstream	spur road - indicates trout spav	wning somewhere in	reach						
		СН	ANNEL	stream	flows across alluvia fan	in this section								
CHANNEL old spur road (75 m downstream UTM)														

Site 3



Plate 1. Upstream view of Toboggan Creek tributary at proposed stream crossing 3.



Plate 2. Downstream view of Toboggan Creek tributary at proposed stream crossing 3. Note the dominant overhanging vegetation.



Plate 3. Dominant gravel substrate at proposed stream crossing 3.



Plate 4. Juvenile rainbow or cutthroat trout captured by electrofishing at proposed stream crossing 3.

													R	each #	ILP I	Map #	ILF	P #	Site
Wate	ershed Cod	e: 000-0	00000-	00000-0	00000-0	000-000	0-000-	000-0	00-000	-000-00	0		3.0		(	)93L.084	10	00	4
									PR	OIE	СТ								
									FN		01								
	Pro	ject Nan	ne: Da	vidson										_					
Dro	Stream Na	ame (gaz	z.): TC	BOGG		EEK	0000	0000	000 00	0 000 0	00.000	000		Pi	roject Co	ode:		18755	
FIO	ject waters		ue. 40	0-24290	00000	0-00000	-0000-	0000-	000-00	0-000-0	00-000-	000							
									WAT	ERS	HED	1							
Gaz	zetted Nam	e:											Loca	al Name	: Site 4.	2+341m	xina, wpt 2		
Wate	ershed Cod	e: 000-0	-00000	00000-0	00000-0	000-000	0-000-	000-0	00-000	-000-00	0								
	ILP Map	#: 093L.	084		ILP #	: 1000	N	IID Ma	ap #:			NID #	¥:		Reac	:h #:	3.0	Site	#: 4
Field L	JTM (Z.E.N	I): 9.610	941.60	31241		Metho	d: GF	53				Si	ite Lg:	300		Method:	HC	Access: F	T
GIS L	JTM (Z.E.N	۱):									I	Ref. N	Name:						
	П	ata: 20	07/10/0	7	Timo	· 17·00			Δαρηςγ	- C660		Crew	A/-	\$1		Fish (	Crd2:	Incom	nlete: 🗸
	D	ale. 20	07/10/0	1		. 17.00			gency	. 0000		CIEV	v.			1 1511 0		IIICOII	
									CH		IEL								
Channe	ol Width (m	Mtd	widt	h wid	th wi	dth wid	dth v	vidth	width	width	n width	n w	idth	width	Avg	Moth	Gadi	ent % Mi	td Avg
Wette	d Width (m	). MS	1.10	0.90	0 1.	30 1.2	+0 ( 20 ·	J.90 1 10	1.30						1.22	Meth	od II:	3.0	5.50
Poo	ol Depth (m	): MS	0.1	5 0.1	0 0.	15 0.2	20								0.15	moun			
								_								No Vi	is.Ch.:	Intermitten	t: 📙
	Wb Deptr	n: .4	.5	.3	5	Avg: 0	.40	N	/lethod:	MS		Stage	e: L	✓ M	н		Dw:	Tribs	.: 🗋
	COVEF	२		٦	Fotal: N	Λ													
	Тур	e: SW	/D	LWD	В	l	J	DP	,	OV	IV		CRO	WN CL	OSURE				
	Amour	nt: D		S	N		5	N		S	T	_	4	/1	-90%				
	LUC. F/3/(	J. 🖌											INST	REAM	VEG:	N	M 🗸	v	
	LWI	D: A			DIST:	E													
	LB SH	P: U											R	B SHP:	S				
	Textur	e:F	G	_ C [	B	_ R _	] A [						٦	Texture:	F 🗸	G 🗌 C	СВ	R 🗌 A	
	RI	P: M												RIP:	М				
	ST	G: MF												STG:	MF				
									V		R								
	EMS	3.							•		- IX		Re	a #·					
	Tem	p: 6						Metho	d: NS	5			Co	ч <i>".</i> nd.: 110	)			Method:	NS
	pł	H: 7.6						Metho	d: NS	6			Ти	ırh · T	с м г			Method:	GE
	Flood Sign:	s: none						Metho	od: GE				10		L l			mourou.	0L
								Μ	OR	РНО	LOG	Y							
	Bod Matoria		Domin	ant: C		Qub	dom <sup>.</sup>	-					01	B1	B2 E	33 D1	D2 D	3	
	D9	n. 5: 25.0	D (c	2.0 cm): 2.0	00	M	orph: F	RP				. Г							
	Patter	n: SI	- (-	,						INDIC	ATORS	-	C1	<u> </u>	C3 (		S1 S	2 53	SA S5
	Island	s: N										Π							
	Coupling	g: DC																	
C	Confinemen	t: FC									Damas								
	FSZ	Z:									Dars:			SIDE				SPAN	вк
									FE.	ATUR	RES								
NID Man		Type	Hat	Me	thod I	lα	Met	hod	1	Photo		<u> </u>		AirPh	noto		UTM (	Z/E/N)	Method
093L.084	9021	C	91			-9			R: 83	884 F:	1	L:		1	#:				method
Commer	nts: all fish	< 30cm ·	- WPT :	3					• •										
NID Map	NID	Туре	Hgt	Me	thod	Lg	Met	hod		Photo				AirPh	noto		UTM (2	Z/E/N)	Method
093L.084	9020	С	.8	M	S				R: 83	883 F:	1	L:			#:				
Commer	nts: cascad	e obstru	ction																

											Reach #	ILP Map #	ILP #	Site
v	Watershed Code: 000-000000-00000-00000-0000-0000-000-0										3.0	093L.084	1000	4
								FEATUI	RES					
NID Ma	ар	NID	Туре	Hgt	Method	Lg	Method	Photo		T	AirPho	to	UTM (Z/E/N)	Method
093L.08	34	9011	С	1.4	MS			R: 8372 F:	1	L:		#:		
Comr	ments	chute	at WPT 0	02 EFU ·	- 150m u/s T	oboggan	creek							
NID Ma	ар	NID	Туре	Hgt	Method	Lg	Method	Photo			AirPho	to	UTM (Z/E/N)	Method
093L.08	34	9010	С	1.4	MS			R: 8371 F:	1	L:		#:		
Comr	ments	: photos	of flag a	nd chute	-	-	-							-
							ΗA	BITAT Q	UAL	. I T Y				
	1	Name								Com	ments			
	(	Cover		S6 CI	lass									
	(	Other		Habit	at Category -	Importar	nt							
0	verW	inter Hal	bitat	Poor	- no pools >	0.5m								
5	Spawr	ing Hab	itat	Fair -	occassional	patches of	of gravel bu	t silty. Few pool	S					
	Reari	ng Habit	tat	Fair -	lots of cover	, few poo	ls							
								PHOTO	DS					
F	Photo		F	Foc Lg		Dir					Co	omments		
R: DIG	6 F	: 8371				D	gul	ly downstream l	JTM ne	ear cros	sing			
R: DIG	6 F	: 8373				Х	car	d						
R: DIG	6 F	: 8374				U	bru	shy channel						
R: DIG	3 F	: 8375				U	bru	shed over chan	nel					
		3376					1 1	n wide channel	maluri	dth	trace of propo	and areasing		
R. DIG		. 0305	I			D	SILE			un ups	tream of propo	sed crossing		
				-				COMME	N I 3					
	S	ection								Com	ments			
	СН	ANNEL		hiked	/shocked for	300 m up	ostream EF	U at Chute						
	СН	ANNEL		fair qu	uality but few	pools - m	nostly shalle	ow riffle - run wit	h 1.5 t	o 2.0 m	channel width	at 2%		
	CH	ANNEL		reach	n 3 habitat is	better								
	СН	ANNEL		Term	inate survey	at WPT 2	200 - upstre	am end						





Plate 1. Heavily vegetated stream channel at proposed stream crossing 4.



Plate 2. 1 m wide channel at proposed stream crossing 4.

								F	Reach #	ILP Ma	ap #	ILP #	Site
Watershed Code: 000-0	00000-00000	-0000-0000	-0000-00	0-000-0	00-000-	000-000		1.(	C	09	3L.084	13	5
					DD		<b>~ т</b>						
					PK	OJE	<b>ا</b> د						
Project Nan	ne: Davidsor	I											
Stream Name (gaz	z.): TOBOGO	GAN CREEK							Р	roject Cod	e:	18	3755
Project Watershed Coo	de: 460-2429	00-00000-00	000-000	0-0000-	000-000	-000-00	0-000-00	0					
<b>-</b>					WAI	EKJI							
Gazetted Name:	00000 00000	00000 0000	0000 00			000 000		Loc	al Name	: Site 5, 3	+694, wpt 00	)8	
Watershed Code: 000-0	00000-00000	-00000-0000	-0000-00 3		100-000- an #:	000-000	N	חו #·		Peach	<i>#</i> . ,	1.0	Sito # 5
		ILI <i>#</i> .			ар #.			ω <i>π</i> .		Reach	π.	1.0	One #: 0
Field UTM (Z.E.N): 9.611	205.6079900	Ν	lethod: (	GP3			D	Site Lg	1:200		Method: GE		Access: FI
GIS UTIVI (Z.E.IN)							R	er. marrie					
Date: 20	07/10/11	Time: 17	:00		Agency:	C660	C	crew:	SJ		Fish Crd?	: 🗸	Incomplete: ✔
					СН	ANN	EL						
Mtd	width wi	dth width	width	width	width	width	width	width	width	Ava		Gadient	% Mtd Avg
Channel Width (m): MS	2.00 1.3	0 1.10	0.50	1.20	1.00					1.18	Method I:	4.0	2.0 C 3.00
Wetted Width (m): MS	1.20 0.	90 0.90	0.35	1.10	0.60					0.84	Method II:		
Pool Depth (m): MS	0.60									0.60			
Wh Denth: 2	2	Δ.,	n 0.20	Ν	lethod.	MS	St	200 <sup>.</sup> I		- н -	NO VIS.CO	.: in w: <b>∠</b>	
00VED		/ W	g. 0.20		neuriou.	WIC	01	uge. L			DV	v. 💌	
COVER		Total: A						-					
Type: SW	D LWD	В	U	DF	) (	VC	IV	CRO	DWN CL	OSURE			
Amount: S			I				N		1	-20%			_
LUC. F73/0.								INS	IREAM	VEG: N			
LWD: A		DIST: E											
LB SHP: S								I	RB SHP:	S			
Texture: F	G C	ВП	R 🗌 A						Texture:	F 🔽 (	G 🗆 C 🗆	B	
RIP: S				_					RIP:	S			
STG: NA									STG:	SHR			
	_	_			14/		<b></b>			_	_	_	
510					VV	AIE	R						
EMS: Temp: 6				Moth	nd NS			Ri Ci	eq #: and : 110	h			Mathad: NS
pH: 7.8				Metho	od: NS			-		,			
Flood Signs: none				Metho	od: GE			T	urb.: T			$\checkmark$	Method: GE
_							0.0 Y						
				IV		HUL	001	01	P1	B2 D2		<u>פרו 2(</u>	
Bed Material:	Dominant: F		Subdom	:									7
D95: 5.00	D (cm): 1	.00	Morph	: RP	D	ISTURE	BANCE						
Pattern: SI						INDICA	TORS	C1	C2	C3 C4	C5 S	S1 S2	S3 S4 S5
Islands: N													
Coupling: DC													
						В	ars:	N	SIDE		AG I		
1.02.								Ŀ					
				HA	ΒΙΤΑ	ΤQU	JALI	ΓY					
Name							C	comment	ts				
Other	Habitat ca	tegory - Mar	ginal										
OverWinter Habitat	None												
Spawning Habitat	None Poor por		hannol										
	F 001 - 110	oois, open			рн	010	S						
Dhata		-	N.L.			010				0			
	ос Lg		nr IS	Care	1				(	comments	õ		
R: DIG F: 8397			D	shel	don and	channe	1						
		1											

				Reach #	ILP Map #	ILP #	Site					
Watershed Cod	le: 000-000000-00000-	00000-0000-0000-0	00-000-000-000-000	1.0	093L.084	13	5					
			PHOTOS									
Photo	Foc Lg	Dir		С	omments							
R: DIG F: 8398	R: DIG F: 8398 U devils club channel											
			COMMENTS									
Section				Comments								
CHANNEL	no defined	channel about 100r	n downstream site UTM since su	bsides into floodpla	lin							
CHANNEL see SJ notes regarding lack of downstream connectivity												
SITE CARD	D(cm) is a	ctually <1										

Site 5



Plate 1. Heavily vegetated stream channel at proposed stream crossing 5.

								I	Reach #		lap #	ILP #	f Site	
Watershed Code: 000-00	0000-00000-	00000-0000	-0000-00	0-000-0	00-000-0	000-000		1.0 093L.084 14 6					6	
						0 1 5 4	<u>а т</u>							
					PR	OJEC	J							
Project Nam	e: Davidson													
Stream Name (gaz	): TOBOGG	AN CREEK							Р	roject Co	de:	1	8755	
Project Watershed Cod	e: 460-2429	00-00000-00	000-000	0-0000-	000-000	-000-000	0-000-00	0						
										_				
					WAI	ERSI	HED							
Gazetted Name:					~~ ~~~ /			Loc	al Name	e: Site 6,	3+844m? WF	PT 009		
Watershed Code: 000-00	0000-00000-	00000-0000	-0000-00	0-000-0	00-000-0	000-000	NI	<b>Б</b> #.		Deeel	- <del>4</del> . 1	0	Cite # C	
ILP Map#. 095L.0	04	ILP #.	4		ар #.		INI	D #.		Read	1#. 1	.0	Sile #. 6	
Field UTM (Z.E.N): 9.6111	99.6079831	Ν	lethod:	GP3			_	Site Lo	j: 200		Method: GE		Access: FT	
GIS UTM (Z.E.N):							Re	et. Name	:					
Date: 200	7/10/11	Time: 18	:00		Agency:	C660	С	rew:	SJ		Fish Crd?:	$\checkmark$	Incomplete: 🗹	•
					СН	ANN	EL							
Mtd	width wi	th width	width	width	width	width	width	width	width	Ava		Gadien	t % Mtd Avc	
Channel Width (m): MS	1.40 1.80	0 1.20	1.80	1.90	2.40	Widdin	maar	maan	wider	1.75	Method I:	3.0	4.0 C 3.50	0
Wetted Width (m): MS	1.20 1.1	10 1.00	1.60	1.20	1.80					1.32	Method II:			
Pool Depth (m): MS	0.15 0.1	15 0.20								0.17				
W/b Dopth: 2					lathad	MC	C+				No Vis.Ch	.:		
Wb Deptil3	.3	AV	j. 0.30	IV.	lethoù.	IVIS	50	age. L			Dw	·. 🗀		
COVER		Total: M						_						
Type: SWI	D LWD	В	U	DP	) (	VC	IV	CRO	OWN CL	OSURE				
Amount: S	S	N	T	N		D	N	3	4	1-70%				
								INS	TREAM	VEG: I		M 🖌 V		
LWD: A		DIST: C												
LB SHP: V									RB SHP	S				
Texture: F	G 🗆 C	П В П	R 🗔 A						Texture	F 🔽	G	в		
RIP <sup>.</sup> M									RIP	·M				
STG: YF									STG	YF				
							_							
					W	ATE	R							
EMS:				•• •				R	eq #:					
Temp: 6				Metho	DD: NS			С	ond.: 120	)			Mothod: NIC	
μπ. 7.0 Flood Signs: none				Metho									wethod. NS	
r lood olgho. Hoho								Т	urb.: T	M		✓	Method: GE	
				mound	Ju. GL			Т	urb.: T	<u> </u>	_ L _ C	✓	Method: GE	
				Metric	I O R P	HOL	OGY	Т	urb.: T	<u> </u>		✓	Method: GE	
Bed Material:	Dominant: G		Subdom	<b>M</b>	I O R P	HOL	OGY	01	urb.: T B1	□ M [ B2 B	L C	<ul><li>✓</li><li>2 D3</li></ul>	Method: GE	
Bed Material: D95: 10.0	Dominant: G D (cm): 2	.00	Subdom Morph	.: F :: RP	I O R P	HOL	OGY	01	urb.: T B1	B2 B	3 D1 D	<ul> <li>✓</li> <li>2 D3</li> <li>☐</li> </ul>	Method: GE	
Bed Material: D95: 10.0 Pattern: SI	Dominant: G D (cm): 2	.00	Subdom Morph	: F : RP	I O R P	HOL ISTURE	OGY BANCE TORS	01 C1	Urb.: T B1 C2	B2 B C3 C	3 D1 D	2 D3	Method: GE	35
Bed Material: D95: 10.0 Pattern: SI Islands: N	Dominant: G D (cm): 2	.00	Subdom Morph	E F I: RP	I O R P	HOL ISTURE	OGY BANCE TORS	01 C1	B1 C2	B2 B C3 C	3 D1 D 4 C5 S	2 D3 1 S2	Method: GE	35
Bed Material: D95: 10.0 Pattern: SI Islands: N Coupling: DC	Dominant: G D (cm): 2	.00	Subdom Morph	E F I: RP	I O R P	HOL ISTURE INDICA	OGY BANCE TORS	01 C1	Image: organized system       B1       C2       Image: organized system	B2 B C3 C	3 D1 D 4 C5 S	2 D3 1 S2	Method:         GE	35
Bed Material: D95: 10.0 Pattern: SI Islands: N Coupling: DC Confinement: OC	Dominant: G D (cm): 2	.00	Subdom Morph	: F : RP	I O R P	HOL ISTURE INDICA	OGY BANCE TORS		Furb.: T B1 C2 SIDI			2 D3 1 C 1 S2	Method:         GE	35
Bed Material: D95: 10.0 Pattern: SI Islands: N Coupling: DC Confinement: OC FSZ:	Dominant: G D (cm): 2	.00	Subdom Morph	: F : RP	I O R P	HOL ISTURE INDICA	OGY BANCE TORS	01 C1 N	B1 C2 SIDI	B2 B C3 C	3 D1 D 4 C5 S DIAG	2 D3 1 S2 1 S2	Method:         GE	35
Bed Material: D95: 10.0 Pattern: SI Islands: N Coupling: DC Confinement: OC FSZ:	Dominant: G D (cm): 2	.00	Subdom Morph	.: F :: RP H A I		HOL ISTURE INDICA B: B:	OGY BANCE TORS ars:		B1 C2 SID	B2 B C3 C E C C	3 D1 D 4 C5 S DIAG	<ul> <li>✓</li> <li>2 D3</li> <li>1 S2</li> <li>1 S2</li> <li>1 MID</li> </ul>	Method: GE S3 S4 S SPAN BF	35
Bed Material: D95: 10.0 Pattern: SI Islands: N Coupling: DC Confinement: OC FSZ:	Dominant: G D (cm): 2	.00	Subdom Morph	Mark M : F : RP H A I	D	HOL ISTURE INDICA B: TQL	OGY BANCE TORS ars: JALII		B1 C2 SIDI	B2 B C3 C E C C	3 D1 D 3 D1 D 4 C5 S DIAG	<ul> <li>2 D3</li> <li>1 S2</li> <li>1 I S2</li> <li>1 I I I I I I I I I I I I I I I I I I I</li></ul>	Method: GE S3 S4 S SPAN BF	35
Bed Material: D95: 10.0 Pattern: SI Islands: N Coupling: DC Confinement: OC FSZ: Name OverWinter Habitat	Dominant: G D (cm): 2	.00 leep areas	Subdom Morph	мала :: F :: RP НАІ	D	HOL ISTURE INDICA Ba	OGY BANCE TORS ars: JALII		B1 C2 SIDI	B2 B C3 C E [ [	3 D1 D 3 D1 D 4 C5 S DIAG	<ul> <li>2 D3</li> <li>1 S2</li> <li>1 I</li> <li>1 I</li> <li>1 I</li> </ul>	Method: GE S3 S4 S SPAN BF	\$5
Bed Material: D95: 10.0 Pattern: SI Islands: N Coupling: DC Confinement: OC FSZ: Name OverWinter Habitat Spawning Habitat	Dominant: G D (cm): 2 Poor - no c Poor - no c	.00 leep areas assional mic	Subdom Morph	.: F :: RP HAI	D	HOL ISTURE INDICA B TQL	OGY BANCE TORS ars: JALII		B1 C2 SIDI		3 D1 D 3 D1 D 4 C5 S DIAG	2 D3 1 S2 1 IIII	Method: GE S3 S4 S SPAN BF	35 □□□ ■□
Bed Material: D95: 10.0 Pattern: SI Islands: N Coupling: DC Confinement: OC FSZ: Name OverWinter Habitat Spawning Habitat Rearing Habitat	Dominant: G D (cm): 2 D (cm): 2 Poor - no c Poor - occa Fair - few p	.00 leep areas assional mic	Subdom Morph	Main M : F : RP H A I	D	HOL ISTURE INDICA B: TQL	OGY BANCE TORS ars: JALII	01 C1 □ N▼	B1 C2 SIDI	B2 B C3 C E C C	3 D1 D 3 D1 D 4 C5 S DIAG	<ul> <li>✓</li> <li>2 D3</li> <li>1 S2</li> <li>1 I</li> <li>1 I</li></ul>	Method: GE S3 S4 S SPAN BF	35
Bed Material: D95: 10.0 Pattern: SI Islands: N Coupling: DC Confinement: OC FSZ: Name OverWinter Habitat Spawning Habitat Rearing Habitat	Dominant: G D (cm): 2 Poor - no c Poor - occ Fair - few p	.00 leep areas assional mic	Subdom Morph	Main M :: F :: RP HAI		HOL ISTURE INDICA B: TQL	OGY BANCE TORS ars: JALII C		B1 C2 SIDI		3 D1 D 3 D1 D 4 C5 S DIAG N	✓       2     D3       1     S2       1     S2       /ID	Method: GE S3 S4 S SPAN BF SPAN	35
Bed Material: D95: 10.0 Pattern: SI Islands: N Coupling: DC Confinement: OC FSZ: Name OverWinter Habitat Spawning Habitat Rearing Habitat	Dominant: G D (cm): 2 Poor - no c Poor - occa Fair - few p poc Lg	.00 leep areas assional mic pools, good	Subdom Morph	HAI			OGY BANCE TORS ars: JALII C		B1 C2 SIDI	B2 B C3 C E C C	3 D1 D 3 D1 D 4 C5 S DIAG N	2 D3 1 S2 √ID	Method: GE S3 S4 S SPAN BF BF	35
Bed Material: D95: 10.0 Pattern: SI Islands: N Coupling: DC Confinement: OC FSZ:	Dominant: G D (cm): 2 Poor - no c Poor - occa Fair - few p Doc Lg	.00 leep areas assional mic pools, good	Subdom Morph ropatche cover	HAI s	D D BITA PH card		OGY BANCE TORS ars: C S		B1 C2 SIDI	B2 B C3 C C Commen	L     C       3     D1       0     0       1     0       14     C5       0     0       0     0       0     0       0     0       1	2 D3 1 S2 √IID	Method: GE S3 S4 S SPAN BF SPAN	\$5
Bed Material: D95: 10.0 Pattern: SI Islands: N Coupling: DC Confinement: OC FSZ:	Dominant: G D (cm): 2 Poor - no c Poor - occa Fair - few p Dc Lg	.00 leep areas assional mic pools, good (	Subdom Morph ropatche cover	HAI S	BITA PH card		OGY BANCE TORS ars: C S		B1 C2 SIDI	B2 B C3 C E C Commen	L       C         3       D1         0       0         4       C5         0       0         0       0         0       0         1       0 <td< td=""><td>2 D3 1 S2 1/ID</td><td>Method: GE S3 S4 S SPAN BF SPAN</td><td>\$5</td></td<>	2 D3 1 S2 1/ID	Method: GE S3 S4 S SPAN BF SPAN	\$5

Site 6



Plate 1. Downstream view of tributary creek at stream crossing 6.



Plate 2. Upstream view of tributary creek at stream crossing 6.



Plate 3. 117 mm Dolly Varden captured by electrofishing at stream crossing 6.



Plate 4. 55 mm juvenile fish captured by electrofishing at stream crossing 6.

											Reach #	t ILP	Map #	ILP	# S	ite
Watershed Co	Watershed Code: 000-000000-00000-00000-0000-0000-000-0										.1		093L.084	98	\$	7
							DP		ст							
							гл		01							
Pr	oject Nam	ne: David	lson													
Stream N	lame (gaz	.): ТОВС	DGGA	N CREEK							F	Project C	ode:		18755	
Project Wate	rshed Coc	le: 460-2	42900	-00000-00	000-000	0-0000-	-000-000	0-000-0	00-000-00	00						
							\A/ A T	EDC								
							WAI	EKJ	ΠΕυ			0.1				
Gazetted Nar	ne: de: 000 0		000 00	000 0000	0000 00			000 00	0	LC	ocal Nam	e: Site /	, 4+200m			
Watershed Co	ae. 000-00 n#: 0931 (	00000-000 184	000-00	UUU-UUUU·	-0000-00 8		200-000- 20 #:	000-00	U N	חוו #י		Rea	ch #·	1	Sito #: 7	,
				ILI #. О			ир #.			0'L I		Rea			0110 #. 1	
	N): 9.6110	JUU.60793	383	IV	lethod:	3P3			D	Site L	_g: 100		wethod: C	JE	Access: V4	
GIS 01101 (Z.L.	IN)										ie.					
I	Date: 200	07/08/01		Time: 11:	30		Agency:	C660	(	Crew:	SJ		Fish C	rd?:	Incomple	te: 🗸
							СН	ANN	EL							
	Mtd	width	width	width	width	width	width	width	width	width	width	Avg		Gadie	nt % Mtd	Avg
Channel Width (r	n): HC	15.00	17.00									16.00	Metho	od I: 3.0	4.0 GE	5.25
Wetted Width (r	n): HC	11.00	8.00									9.50	Metho	d II: 6.0	8.0 GE	
Pool Depth (r	n): NS	72.00	60.00	)								66.00	No Via	<b>Ch</b>	Intermittent:	-
Wb Dep	th 10			Ava	· 100		Method:	GE	s	tage. I	Μ				Tribs ·	
			То	tol: M		•		01	Ū		- 🗆			J		
			10					$\sim$	N /							
Amou	pe: SW			В	U			S S	IV N			LUSURE 1-20%	1			
Loc: P/S	/0:														V	
											STREAM	IVLG.			•	
LW	/D: F		I	DIST: C												
LB SI	HP: S										RB SHF	P: S				
Textu	ure: F 📐	G 🗸	C 🗸	] B 🗌 F	R 🗌 A						Texture	e: F 🔽	G 🔽 C	✓ <sup>B</sup>	R 🗌 A 🗌	]
F	RIP: M										RIF	P: M				
S	TG: MF										STO	9: MF				
							W		P							
EN	10.								i N	r	Dog #:					
Ten	10. 10 <sup>.</sup>					Meth	od.			г (	Cond :				Method:	
	bH:					Meth	od:			,				<b>.</b> _		_
Flood Sig	ns: channe	el erosion	and.			Meth	od: GE				TURD.: I	М			Method: G	E
						R.				,						
						IV.				01	P1	<b>P</b> 2	P3 D1	D2 D3	2	
Bed Mater	ial:	Dominan	t: C		Subdom	: B						D2			,	
D	95:	D (cm)	):		Morph	: CP	[	DISTUR	BANCE			$\checkmark$				
Patte	rn: SI							INDIC	ATORS	C1	C2	C3	C4 C5	S1 S2	S3 S4	4 S5
Islan	ds: N											$\checkmark$			] 🔽 🗌	
Couplin	ng: PC															
Contineme								I	Bars:	N	SIC	DE 🗸	DIAG	MID	SPAN	BR
FC	SZ.															
						ΗA	BITA	TQ	UALI	ТΥ						
Name									(	Comme	nts					
Other		Habita	t Categ	gory - Impo	ortant - li	kely typ	ical of th	e alluvi	al fan rea	ach						
OverWinter Ha	bitat	Poor -	Few de	eep pools	- mostly	fast flov	N									
Spawning Hab	oitat	Poor -	only or	ccassional	micropa	atch and	mostly	cobble	boulder s	substrate	es					
Rearing Habi	tat	Fair - F	-ast ca	scade mo	stly, few	plunge	pools ar	nd good	LWD co	ver ups	tream in	jams				_
	1					-	P F		18							
Photo	F	oc Lg		D	ir	<u> </u>			0.465			Comme	nts			
R: 6014 F: 6046				N	5	pho of p	tos 6014 roposed	to 604 alignm	ю. 100m ent	section	trom exis	sung ford	aownstrean	n to unstable	e section dowr	nstream

	Reach #	ILP Map #	ILP #	Site
Watershed Code: 000-000000-00000-0000-0000-0000-000-00	.1	093L.084	98	7

	COMMENTS								
Section	Comments								
CHANNEL	Steep fan gradients on south side.								
CHANNEL	existing ford is near apex (upstream end) of alluvial fan of 75 to 125m wide through site.								
CHANNEL	No spawning habitat in segment examined								
CHANNEL	T2 (second channel and wetted width) At ford disturbed RIPrad on south side. 60m fan (toe to toe)								
CHANNEL	T1 also 75m wide from toe to toe including south road route								
CHANNEL	orange flag trail - 50 m downstream ford (T1 - first channel and wetted width lengths)								
CHANNEL	Flood signs - abundant overbank silt and channel erosion								
CHANNEL	Fan and Floodplain								

Site 7



Plate 1. Upper Toboggan Creek at proposed stream crossing 7.



Plate 2. Upper Toboggan Creek at proposed stream crossing 7.



Plate 3. Upper Toboggan Creek at proposed stream crossing 7.



Plate 4. Plunge pool with large woody debris at proposed stream crossing 7

									Reach #	ILP Ma	ap #	ILP #	Site
Watershed Code: 000-000	0000-00000-	0000-0000	-0000-00	0-000-0	000-000-0	000-000		1.	.0	09	3L.084	1000	8
					PR	OJEO	СТ						
Project Name: Davidson													
Stream Name (gaz )	· TOBOGO	AN CREEK							P	Proiect Cod	e.	18	755
Project Watershed Code: 460-242900-00000-0000-0000-0000-000-000-000-00													
					WAT	ERSI	HED						
Gazetted Name:								Lo	cal Name	e: Site 8, C	Creek 100		
Watershed Code: 000-000	0000-00000-	00000-0000	-0000-00	0-000-0	)00-000-0	000-000		ID #.		Deeeb	щ. А	0	0.4- #-0
ILP Map#: 093L.08	34	ILP #: 10	00	NID M	ар #:		N	ID #:		Reach	#: 1	.0	Site #: 8
Field UTM (Z.E.N): 9.61160	0.6078550	N	lethod:	0				Site L	g: 100		Method: GE	A	Access: V4
GIS UTM (Z.E.N):							R	er. Name	e:				
Date: 2007	/08/01	Time: 14:	30		Agency:	C660	C	Crew:	SJ DG		Fish Crd?:		Incomplete: 🗹
					СН	ANN	EL						
Mtd	width wi	dth width	width	width	width	width	width	width	width	Avg		Gadient	% Mtd Avg
Channel Width (m): GE	1.00 1.70	0 1.30	1.60							1.40	Method I:	3.0 5	.0 GE 4.00
Wetted Width (m): GE	0.80 1.	50 1.30	1.40							1.25	Method II:		
Poor Deptri (m). GE										0.00	No Vis.Ch	.: 🗌 Int	ermittent:
Wb Depth: .3	.3	2 Avg	: 0.27	ſ	Method:	GE	St	age: L	✓ M	Н	Dw	<i>ı</i> : 🗌	Tribs.:
COVER		Total: A											
Type: SWD	LWD	В	U	DF	D (	VC	IV	CR	OWN CL	OSURE			
Amount: T	S	Ν	S	N		D	Ν	3	4	1-70%			
Loc: P/S/O:								INS	STREAM	VEG: N	□ A □	M 🗸 V	
LWD: F		DIST: E						_					
I B SHP' S									RB SHP	· S			
Texture: F	G 🗆 C		R 🖂 A						Texture	: F 🔽 (	GПСП	B	
RIP: M									RIP	: M			
STG: MF									STG	: MF			
					w	ATE	R						
EMS <sup>.</sup>								R	ea #:				
Temp:				Meth	od:			C	Cond.:				Method:
pH:				Meth	od:			-	Turb · T				Method <sup>.</sup>
Flood Signs: none				Meth	od: GE							V	
				Ν	IORP	HOL	OGY						
Bed Material: D	ominant: G		Subdom	: F				01	B1	B2 B3	5 D1 D	2 D3	
D95: 15.0	D (cm): 1	.00	Morph	: RP	г								]
Pattern: SI					L	INDICA	TORS	C1	C2	C3 C4	C5 S	1 S2	S3 S4 S5
Islands: N													
Coupling: DC													
Confinement: OC						B	ars.	N	I SIDI				
FSZ:							aro.						
				ΗA	ΒΙΤΑ	ΤQU	JALI.	ГΥ					
Name	1						C	Commer	nts				
Cover	S4 Class												
Other	Habitat Ca	tegory = Ma	rginal										
Spawning Habitat	poor - no d	eep pools olly varden s	pawing i	n fine a	avels hu	t poor p	ool deve	lopment	t				
Rearing Habitat	Fair - Lots	of cover but	few pool	Is and n	one deer	per than	0.2m		•				
					ΡH	ото	S						
Photo Fo	c Lg	D	ir	1						Comments	;		
R: DIG F: 6054		N	S	pho	tos 6054	to 6060	(Card, ι	upstrear	n, downs	tream, sub	strate and rip	arian veg	- ALL Dev Club)

		Reach #	ILP Map #	ILP #	Site
Watershed Code: 000-00	0000-0000-0000-0000-000-000-000-000-000-000-000	1.0	093L.084	1000	8
	COMMENTS				
Section	С	omments			
CHANNEL	small S4 which is about 5% at crossing of blue flag - likely 1500	m embedded CV			
CHANNEL	hiked downstream of old blue 'north route' flagging for 75m and j	oins creek 101 - di	ry.		
SITE CARD	Guess at GIS Field point. Not written on data card.				

Site 8





Plate 1. Upstream view of proposed stream crossing site 8.

Plate 2. Substrate observed at proposed stream crossing site .



Plate 3. Downstream view of proposed stream crossing site 8.

			Reach # ILP Map #	ILP # Site								
Watershed Code: 000-000	000-0000-0000-0000-0000-0000	-000-000-000-000	3.0 093L.084	15 9								
		PROJECT										
Project Name: Davidson												
Project Name	E Davidson		Project Code:	10765								
Project Watershed Code	). TOBOGGAN CREEK 2: 460-242900-00000-00000-0000	-0000-000-000-000-000-000	Project Code.	6700								
		WATERSHED										
Gazetted Name:			Local Name: Site 9, xing is 150m	u/s ford								
Watershed Code: 000-000	0000-00000-00000-0000-0000	-000-000-000-000										
ILP Map#: 093L.08	34 ILP #: 15	NID Map #: NID #	: Reach #:	3.0 Site #: 9								
Field UTM (Z.E.N): 9.61185	50.6076100 Method:	O Sit	te Lg: 100 Method: GE	Access: V4								
GIS UTM (Z.E.N):		Ref. N	ame:									
Date: 2007	7/08/01 Time: 16:00	Agency: C660 Crew	: SJ AND DS Fish Crd?	: 🗌 Incomplete: 🗹								
		CHANNEL										
Mtd	width width width	width width width wid	dth width Avg	Gadient % Mtd Avg								
Channel Width (m): GE	15.00 18.00		16.50 Method I	: 5.0 6.0 GE 4.50								
Wetted Width (m): GE	7.00 5.00		6.00 Method II	: 3.0 4.0 GE								
Pool Depth (m): GE			0.00 No Vis Ct									
Wb Depth: 1.2	1.1 Avg: 1.15	Method: GE Stage		w: Tribs.:								
COVER	Total <sup>.</sup> M	· ·										
			CROWN CLOSURE									
Amount: N	S D T	N S N	1 1-20%									
Loc: P/S/O:			INSTREAM VEG: N 🔽 A	M								
LVVD: A	DISTEC											
LB SHP: V			RB SHP: V									
RIP: M			RIP: M									
516.11			316.11									
		WATER										
EMS:			Req #:									
Temp:		Method:	Cond.:	Method:								
Flood Signs: see com	nment	Method: GF	Turb.: T 🗌 M 🗌 L 🖌 C	Method: GE								
		MORPHOLOGY										
Bed Material: D	Dominant: C Subdom:	B (	יו איז									
D95:	D (cm): Morph:	DISTURBANCE										
Pattern: SI		INDICATORS (	C1 C2 C3 C4 C5 S	S1 S2 S3 S4 S5								
Islands: N												
Coupling: PC												
FSZ:		Bars: N										
		HABITAT QUALITY										
Name		Com	ments									
OverWinter Habitat	Habitat Category - marginal, but	important for only dolly varden/ST re	ear for most.									
Spawning Habitat	none											
Rearing Habitat	Fair - no pools, mostly continous	cascade run										
		COMMENTS										
Section		Com	ments									
CHANNEL	North side is more in fill out relic	channel										

		Reach #	ILP Map #	ILP #	Site			
Watershed Code: 000-	000000-00000-0000-0000-000-000-000-000-000-000	3.0	093L.084	15	9			
	COMMENTS							
Section		Comments						
CHANNEL Possible fill onto medium bench terrace on south side from shift downstream 10m from blue								
CHANNEL	28 m span on lock blocks							
CHANNEL	Abundant cobble bar over banks.							
CHANNEL	Reach upstream of ford is active channel on steep alluvial fan v	vith 5 to 10 year old	jams and sediment	wedges breaking	g down.			
CHANNEL	Floodsigns - Abundant overbank cobble deposits							
CHANNEL	Gradient - Downstream is 5 to 6%, upstream is 3 to 4%							
CHANNEL	GPS [point not entered - is a guess from map.							



Plate 1. Upstream view of Glacier Gulch Creek at proposed stream crossing site 9.



Plate 2. Downstream view of Glacier Gulch Creek at proposed stream crossing site 9.



Plate 1. Cobble and boulder substrate observed at proposed stream crossing site 9.

					Reach #	ILP Map #	ILP #	Site					
Watershed Code: 000-000	000-00000-0000	-0000-0000-000-	000-000-000-00	0-000	.1	093L.084	1020	10					
				IFCT									
Project Name:	Davidson												
Stream Name (gaz.):	TOBOGGAN C	REEK		Pr	oject Code:	18755							
Project Watershed Code:	460-242900-000	00-00000-0000-0	0000-000-000-0	00-000-000-00	0								
			WATE	RSHED									
Gazetted Name <sup>.</sup>					Local Name:	Site 10 Club Creek	6+450m						
Watershed Code: 000-000	000-00000-00000	-0000-0000-000-	000-000-000-00	0-000	Loodi Humo.								
ILP Map#: 093L.08	4 ILP	#: 1020 N	IID Map #:	NI	D #:	Reach #:	.1 .	Site #: 10					
Field UTM (Z.E.N): 9.61196	4.6077631	Method: GF	23		Site Lg: 100	Method: GE	Acces	ss: V4					
GIS UTM (Z.E.N):				Re	f. Name:								
Dete: 2007	/08/01 Tim		A gapour Ci	260 0		Fish Ord							
Date: 2007	108/01	ie. 16.00	Agency. Co		1ew. 35 D3	FISITCIU	. [] "						
			СНА	NNEL			<u> </u>						
Channel Width (m): CE	width width v	vidth width w	viath width v	width width	width width	Avg 3.67 Method I	Gadient %	Ntd Avg					
Wetted Width (m): GE	2.50 3.50 2	2.50				2 83 Method II	. 4.0 5.0	GE 4.50					
Pool Depth (m):	2.00 0.00					0.00							
					<u> </u>	No Vis.Ch	n.: 📃 Intermi	ttent:					
Wb Depth: .8	1.0 .4	Avg: 0.73	Method: G	E Sta	age: L 🔤 M 💽		w: 🔄 🛛 T	ribs.:					
COVER	Total:	М											
Type: SWD	LWD E	3 U	DP OV	/ IV	CROWN CLO	DSURE							
Amount:	S S	S S	N D	N									
					INSTREAM	/EG: N A	MUV						
LWD: F	DIST	Г: Е											
LB SHP: S					RB SHP:	U							
Texture: F 🗸	G 🖌 C 🖌 B				Texture:	F 🔽 G 🗌 C 🗸	B R	A					
RIP: C			_		RIP:	c							
STG: YF					STG:	YF							
			W A	TER									
EMS:					Reg #								
Temp:			Method:		Cond.:		Met	hod:					
pH:			Method:		Turb · T		- Met	hod: GE					
Flood Signs: alluvial fa	an		Method: GE										
			MORPH	IOLOGY									
Bed Material: D	ominant: C	Subdom: F	1		O1 B1	B2 B3 D1 I	D2 D3						
Ded Material: D95:	D (cm):	Morph: C	, P pio										
Pattern: ST			IN	DICATORS	C1 C2	$C_3 C_4 C_5 S_5$	<u> </u>	3 84 85					
Islands: N													
Coupling: DC													
Confinement: OC				P									
FSZ:				Bars:	NV SIDE	DIAG	MID SPA	N BR					
			HABITAT	QUALIT	Y								
Name	1				omments								
Other	Default S3 class			0	ommento								
OverWinter Habitat	Poor - no deep po	ools											
Spawning Habitat	None - observed	no substrate											
Rearing Habitat	Fair - feww pools	, fast continuous	cascades and m	oderate cover									
			COMM	AENTS									
Section				C	omments								
CHANNEL	no spawning hab	itat visible in light	ly turbid modera	te flows and ca	ascade pool								

Watershed Code: 000-000		Reach #	ILP Map #	ILP #	Site
		. 1	0332.004	1020	10
	COMMENTS				
Section	Ca	omments			
CHANNEL	no problems - 0.5 to 1.0 m high banks.				
CHANNEL	crossing at pink mcellhaney line is 3 m channel width and slight s	kew.			
SITE CARD	see photos, both crossings				

								Reach #	ILP M	ap #	ILP #	Site	
Watershed Code: 000-000	0000-0000-0	0-0000-0000-0	000-000-0	000-000-0	000-000	0-000		1.0	09	3L.084	12	11	
				F	RO	JECT							
Project Name	Project Name: Davidson												
Stream Name (gaz.)	Stream Name (gaz.): TOBOGGAN CREEK								Project Cod	e:	1875	5	
Project Watershed Code	e: 460-24290	00-00000-000	00-0000-000	000-000	-000-00	0-000-000-0	000		-				
Constant Normal				VV A	A I E I	RSHED			044 10	D4 4:070	-+ 7		
Gazetted Name: Watershed Code: 000-00	0000-00000-	0000-0000-0	)000-000-(	000-000-0	00-000	0.000	L	ocal Name	e: Site NC	D1, 1+073, wp	Dt 7		
ILP Map#: 093L.08	84	ILP #: 12	N	ID Map #	:	1	NID #:		Reach	#: 1.	.0	Site #: 11	
Field UTM (Z.E.N): 9.61092	20.6082424	Ме	thod: GP	'3			Site I	Lg: 100		Method: GE	Acc	ess: FT	
GIS UTM (Z.E.N):						F	Ref. Nan	ne:					
Date: 2007	7/10/11	Time: 16:0	0	Agei	ncy: C6	60	Crew:	SJ		Fish Crd?:		Incomplete: 🗸	
					HA	NNEL						·	
Mtd	width wid	th width	width w	vidth wi	dth w	vidth width	width	n width	Avg	Г	Gadient %	Mtd Avg	
Channel Width (m):									0.00	Method I:		0.00	
Wetted Width (m):							-		0.00	Method II:			
Poor Depth (m).									0.00	No Vis.Ch.:	: 🗌 Interr	nittent:	
Wb Depth:		Avg:	0.00	Meth	od:	S	Stage: I	M	н 🗌	Dw	:	Tribs.:	
COVER		Total:											
Type: SWD	) LWD	В	U	DP	OV	IV	CI	ROWN CL	OSURE				
Amount:												_	
Loc. P/S/O.							IN	ISTREAM	VEG: N		M V		
LWD:		DIST:											
LB SHP:								RB SHP	:				
Texture: F	] G 🗌 C [							Texture	: F 🗌 (	G C C	BR		
RIP:								RIP	:				
516.								316	•				
					W A	TER							
EMS:				Mothod				Req #:			5.4	athad	
pH:				Method:				сопа ть. т	— N —				
Flood Signs:			I	Method:				TUND.: T				ethod:	
				MO	RPH	OLOGY	(						
Bed Material:	)ominant:	s	Subdom:				01	B1	B2 B3	5 D1 D2	2 D3		
D95:	D (cm):		Morph:		DIS.								
Pattern:					INI	DICATORS	C1	C2	C3 C4	C5 S	1 S2	S3 S4 S5	
Islands:													
Coupling:													
FS7·						Bars:	N	SID		AG N	1ID SP		
				1	РНО	TOS							
Photo Fo	oc Lg	Dir		card					Comments	5			
R: DIG F: 8394		D	,	brush N	CD								
R: DIG F: 8395		U		brush N	CD								
				C	OMN	IENTS							
Section							Comme	ents					
CHANNEL	Not a defin	ed channel. M	/loist wet g	ground.									

Watershed Code: 000-000000-00000-0000-0000-0000-000-00	Sile										
	12										
PROJECT											
Project Name: Davidson											
Stream Name (oaz.): TOBOGGAN CREEK Project Code: 18755											
Project Watershed Code: 460-242900-00000-0000-0000-000-000-000-000-000											
WATERSHED											
Gazetted Name: Local Name: Site NCD2, Road Station 5+381 - Har	ch Design										
Watershed Code: 000-000000-00000-0000-0000-000-000-000	to #110										
ILP Wap#. 093L.064 ILP #. 101 NID Wap #. NID #. Reach #. 1.0 Si	le #. 12										
Field UTM (Z.E.N): 9.611600.6078550 Method: GP3 Site Lg: 100 Method: GE Access	: F I										
	_										
Date: 2007/08/01 Time: 12:00 Agency: C660 Crew: SJ DG Fish Crd?:	omplete: 🗹										
CHANNEL											
Mtd         width         width         width         width         width         width         width         width         width         Avg         Gadient %	Mtd Avg										
Channel Width (m): 0.00 Method I: 5.0 10.0	GE 7.50										
Pool Depth (m):											
No Vis.Ch.: Intermitte	ent: 🗌										
Wb Depth:         Avg: 0.00         Method:         Stage: L         M         H         Dw:         Tri	bs.:										
COVER Total:											
Type: SWD LWD B U DP OV IV CROWN CLOSURE											
LWD: DIST:											
LB SHP: RB SHP:											
	Α 🗌										
RIP:	A 🗌										
RIP: STG: RIP: STG:	A 🗌										
RIP: STG: STG: STG: STG: STG: STG: STG: STG	A										
RIP: STG: RIP: STG: RIP: STG: RIP: STG: RIP: STG: RIP: STG: STG: STG: STG: STG: STG: STG: STG	A										
RIP: RIP: STG: RIP: STG: STG: STG: STG: STG: STG: STG: STG	A										
RIP:     RIP:       STG:     STG:         WATER         EMS:     Req #:       Temp:     Method:       pH:     Method:       Flood Signs:     Method:	A										
RIP:     RIP:       STG:     STG:         WATER         EMS:     Req #:       Temp:     Method:       PH:     Method:       Flood Signs:     Method:	A										
RIP:       RIP:         STG:       STG:         WATER       Req #:         EMS:       Req #:         Temp:       Method:       Cond.:       Method:         pH:       Method:       Turb.: T M L C Method:         Flood Signs:       MOR PHOLOG Y	A										
RIP:       RIP:         STG:       STG:         EMS:       Req #:         Temp:       Method:         pH:       Method:         Flood Signs:       Method:         Turb.:       T         MOR P HOLOGY         Bed Material:       Dominant:         Subdom:       O1         BI       B2         Ba       D1         D2       D3	A										
RIP:       RIP:       RIP:         STG:       STG:         EMS:       Req #:         Temp:       Method:         PH:       Method:         Flood Signs:       Method:         Turb.:       T         Mothod:       Method:         Flood Signs:       Method:         Dominant:       Subdom:         D95:       D (cm):         Morph:       DISTURBANCE         INDICATORS	A										
RIP:	A										
RIP:	A										
RIP:	A										
RIP:       STG:       RIP:       STG:       STG:         STG:       STG:       STG:       STG:         EMS:       WATER       STG:       Method:       Method:         PH:       Method:       Cond.:       Method:       Method:         Flood Signs:       Method:       Turb.:       T       M       L       C       Method:         Flood Signs:       Method:       Turb.:       T       M       L       C       Method:         Bed Material:       Dominant:       Subdom:       Subdom:       Image: Subdom:	A										
RIP:       STG:       RIP:       STG:       STG:         STG:       WATER       EMS:       Req #:       Method:       Cond.:       Method:         EMS:       Method:       Cond.:       Method:       Turb.: T M L C C       Method:         Flood Signs:       Method:       Turb.: T M L C C       Method:       Method:       Method:         Bed Material:       Dominant:       Subdom:       OI       BI       B2       B3       D1       D2       D3         P35:       D (cm):       Morph:       DISTURBANCE       C1       C2       C3       C4       C5       S1       S2       S3         Islands:       Coupling:       Ears:       N       SIDE       DIAG       MID       SPAN         HABITAT QUIALITY       HABITAT QUIALITY       KID       SPAN       SPAN	A										
RIP:       STG:       RIP:       STG:         STG:       STG:       STG:         EMS:       Method:       Cond.:       Method:         PH:       Method:       Turb.:       T       M       L       C       Method:         Flood Signs:       Method:       Turb.:       T       M       L       C       Method:         Bed Material:       Dominant:       Subdom:       01       B1       B2       B3       D1       D2       D3         Pattern:       INDICATORS       ISlands:       <	A od: 										
RIP:       STG:       RIP:       STG:	A										
RIP:       STG:       RIP:       STG:         STG:       STG:       STG:         EMS:       Req #:       Method:       Cond.:         PH:       Method:       Turb.: T       M       L       C         Flood Signs:       Method:       Turb.: T       M       L       C       Method:         Pdetains:       Subdom:       More PHOLOG GY       Method:	A										
RIP:       STG:       RIP:         STG:       STG:         EMS:       Req #:         Temp:       Method:       Cond.:         PH:       Method:       Turb.: T M L C Method:         Flood Signs:       Method:       Turb.: T M L C Method:         Bed Material:       Dominant:       Subdom:         D95:       D (cm):       Morph:         D1       B1       B2       B3       D1       D2       D3         Pattern:       INDICATORS       C1       C2       C3       C4       C5       S1       S2       S3         Islands:       INDICATORS       C1       C2       C3       C4       C5       S1       S2       S3         Conpling:       Confinement:       Bars:       N       SIDE       DIAG       MID       SPAN         HABITAT QUALITY       HABITAT QUALITY       Image: Sinternet seepage.       FOTO S       FOTO S       FOTO S       FOTO S	A										
RIP:       STG:       RIP:       STG:         STG:       STG:       STG:         EMS:       Req #:       Method:       Cond.:       Method:         pH:       Method:       Turb.:       T       M       L       C       Method:         Flood Signs:       Method:       Turb.:       T       M       L       C       Method:         PH:       Method:       Turb.:       T       M       L       C       Method:         PH:       Method:       Turb.:       T       M       L       C       Method:         PH:       Method:       Turb.:       T       M       L       C       Method:         DS:       D (cm):       Morph:       DISTURBANCE       InDICATORS       C1       C2       C3       C4       C5       S1       S2       S3         Islands:       Confinement:       Bars:       N       SIDE       DIAG       MID       SPAN         FSZ:       Bars:       N       SIDE       DIAG       MID       SPAN         Mame       Comments       Comments       S       S       S       S       S         Other       Watercourse	A										
RIP:       STG:       RIP:         STG:       STG:         EMS:       Req #:         Temp:       Method:       Cond.:         PH:       Method:       Turb.: T   M   L   C   Method         Flood Signs:       MOR PHOLOGY         Bed Material:       Dominant:       Subdom:         D95:       D (cm):       Morph:         D1       B1       B2       B3       D1       D2       D3         Pattern:       INDICATORS       C1       C2       C3       C4       C5       S1       S2       S3         Islands:       INDICATORS       C1       C2       C3       C4       C5       S1       S2       S3         Coupling:       Confinement:       FSZ:       Bars:       N       SIDE       DIAG       MID       SPAN         Photo       Foc Lg       Dir       Watercourse is ephemeral (dry today) and discontinuous channel with evidence of overland seepage.         P H OT OS         Photo       Foc Lg       Dir       Photo       Foc Lg       Dir       Verdenced 50m downstream skid trail and 50m upstream of ILP 100-         R:       DIG       F:       0051       STD	A										
RIP:       STG:       RIP:         STG:       STG:         EMS:       Req #:         Temp:       Method:       Cond.:         pH:       Method:       Turb.: T M         Flood Signs:       Method:       Turb.: T         MOR PHOLOGY       Method:       Method:         Bed Material:       Dominant:       Subdom:         D95:       D (cm):       Morph:         INDICATORS       C1       C2       C3         Coupling:       Confinement:       FSZ:       Bars:       N:       SIDE       DIAG       MID       SPAN         HABITAT QUALITY         Photo       Foc Lg       Dir       Comments         Photo       Foc Lg       Dir       Comments skid trail and 50m upstream of ILP 100-         R:       DIG       F:       6051       STD       NS       NCD located 50m downstream skid trail and 50m upstream of ILP 100-         R:       DIG       F:       6051       STD       NS       NCD located 50m downstream skid trail and 50m upstream of ILP 100-         R:       DIG       F:       6052       STD       NS       NCD located 50m downstream skid trail and 50m upstream of ILP 100-         R: <td>A</td>	A										

								Reach #	ILP Map #	ILP #	Site	
Watershed Code: 000-000000-00000-0000-0000-0000-000-00								1.0	093L.084	101	12	
	PHOTOS											
Photo Foc Lg Dir Comments												
R:	DIG	F:	6064	ST	D	NS	NCD photos at trail crossi	ng gully				
R:	DIG	F:	6065	ST	D	NS	NCD photos at trail crossi	ng gully				
R:	DIG	F:	6066	ST	D	NS	NCD photos at trail crossi	ng gully				
							COMMENTS					
		Se	ection					Comments				
	:	SITE	CARD		Called strea	am H on Steve Jenn	ing's route map.					
		SITE	CARD		Map UTM -	No field GPS readir	ng					
		CHA	NNEL		No scour.							
		CHA	NNEL		No alluvial	substrate - mostly m	oss on rocks and topsoil.					