

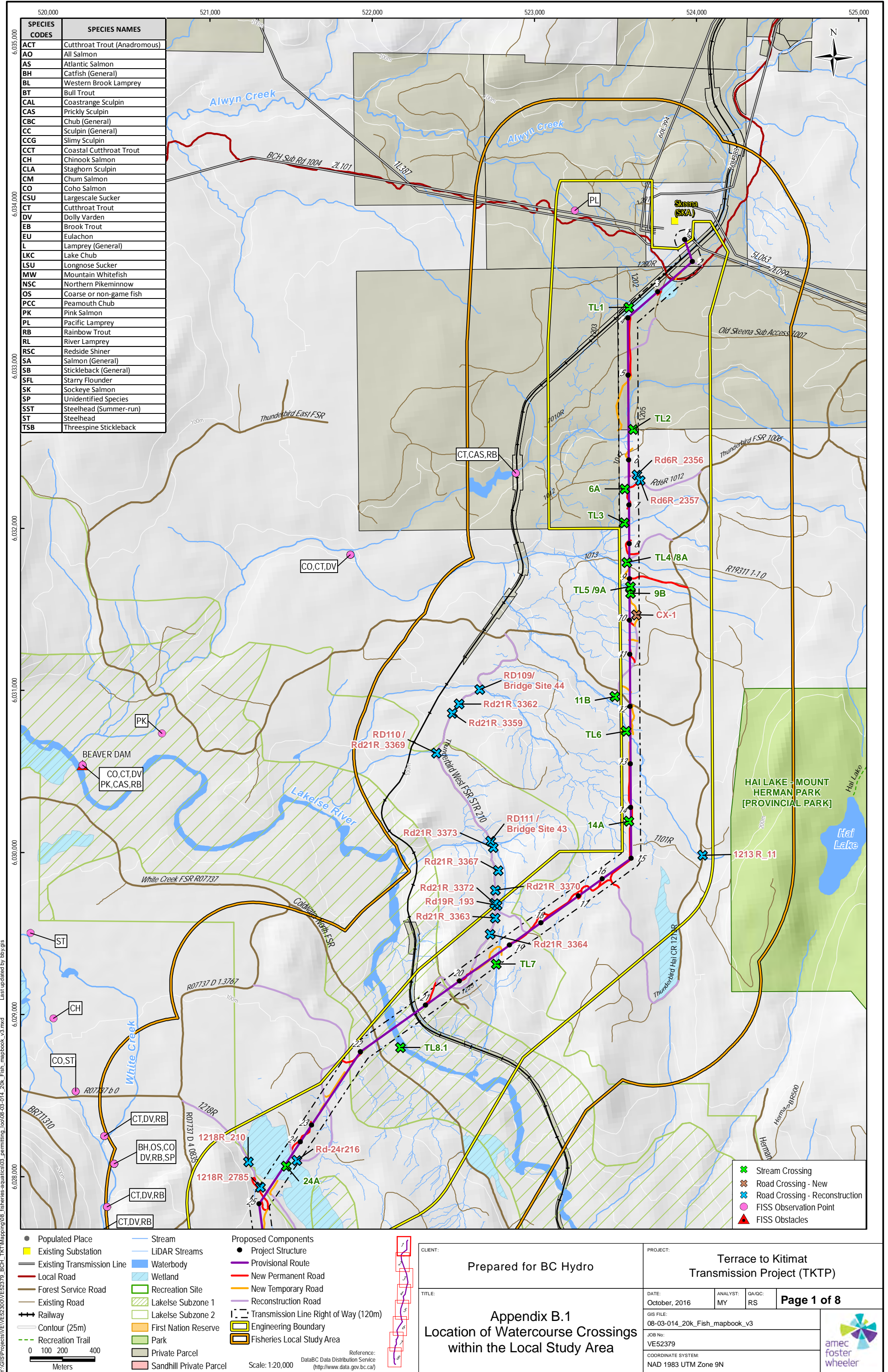
## **Appendix B**



Fisheries and Aquatic Habitat

## **Appendix B.1**

### **Mapbook of Location of Watercourse Crossings within the Local Study Area**



SPECIES CODES	SPECIES NAMES
ACT	Cutthroat Trout (Anadromous)
AO	All Salmon
AS	Atlantic Salmon
BH	Catfish (General)
BL	Western Brook Lamprey
BT	Bull Trout
CAL	Coastrange Sculpin
CAS	Prickly Sculpin
CBC	Chub (General)
CC	Sculpin (General)
CCG	Slimy Sculpin
CCT	Coastal Cutthroat Trout
CH	Chinook Salmon
CLA	Staghorn Sculpin
CM	Chum Salmon
CO	Coho Salmon
CSU	Largescale Sucker
CT	Cutthroat Trout
DV	Dolly Varden
EB	Brook Trout
EU	Eulachon
L	Lamprey (General)
LKC	Lake Chub
LSU	Longnose Sucker
MW	Mountain Whitefish
NSC	Northern Pikeminnow
OS	Coarse or non-game fish
PCC	Peamouth Chub
PK	Pink Salmon
PL	Pacific Lamprey
RB	Rainbow Trout
RL	River Lamprey
RSC	Redside Shiner
SA	Salmon (General)
SB	Stickleback (General)
SFL	Starry Flounder
SK	Sockeye Salmon
SP	Unidentified Species
SST	Steelhead (Summer-run)
ST	Steelhead
TSB	Threespine Stickleback

● Populated Place

■ Existing Substation

— Existing Transmission Line

— Local Road

— Forest Service Road

— Existing Road

— Railway

— Contour (25m)

— Recreation Trail

— Stream

— LIDAR Streams

— Waterbody

— Wetland

— Recreation Site

— Lakelse Subzone 1

— Lakelse Subzone 2

— First Nation Reserve

— Park

— Private Parcel

— Sandhill Private Parcel

● Project Structure

— Provisional Route

— New Permanent Road

— New Temporary Road

— Reconstruction Road

— Transmission Line Right of Way (120m)

— Engineering Boundary

— Fisheries Local Study Area

0 100 200 400

Meters

Scale: 1:20,000

Reference: DataBC Data Distribution Service (http://www.data.gov.bc.ca/)

CLIENT: Prepared for BC Hydro

TITLE: Appendix B.1  
Location of Watercourse Crossings within the Local Study Area

PROJECT: Terrace to Kitimat Transmission Project (TKTP)

DATE: October, 2016

ANALYST: MY

QA/QC: RS

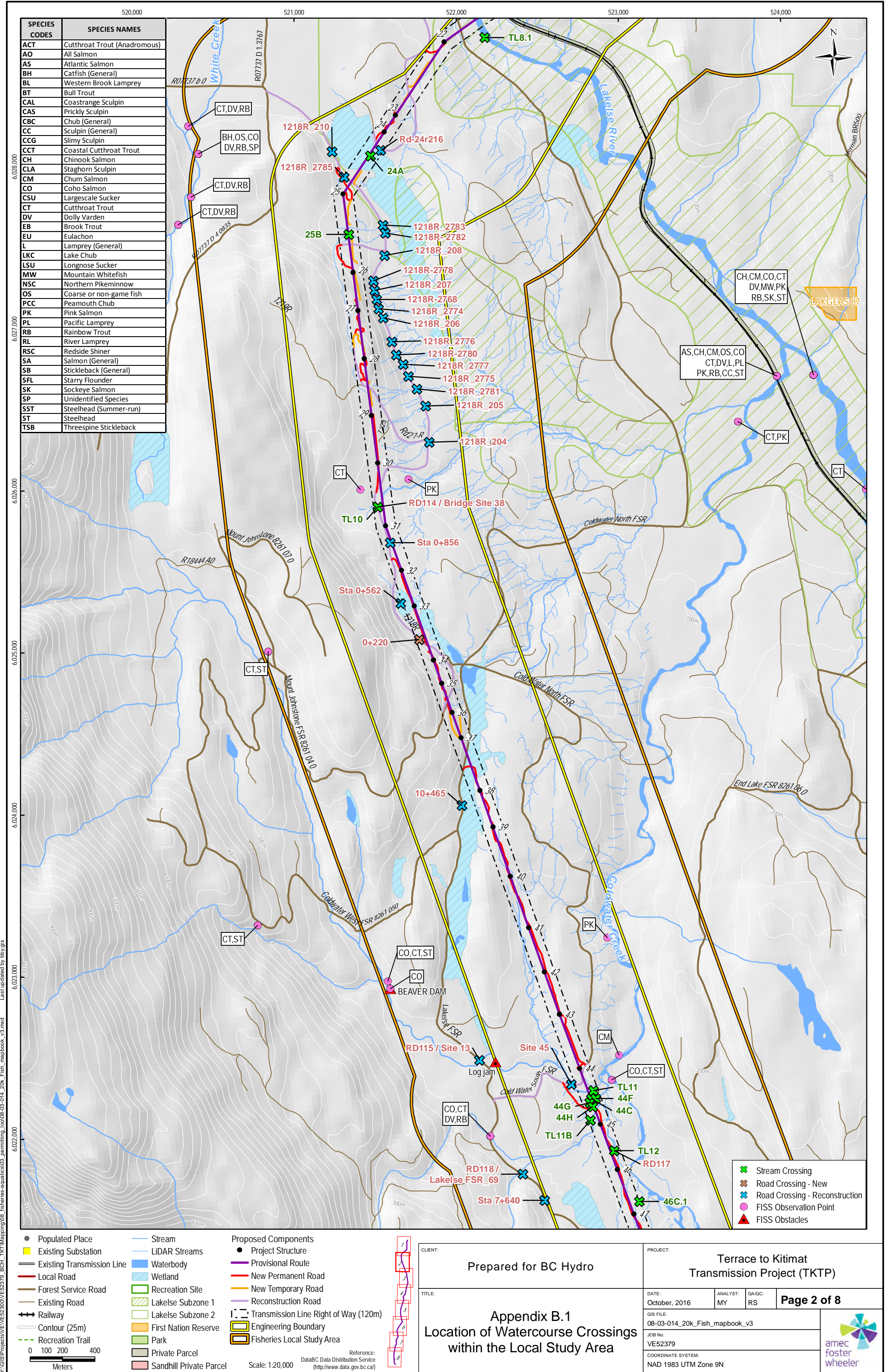
Page 1 of 8

GIS FILE: 08-03-014\_20k\_Fish\_mapbook\_v3

JOB No: VE52379

COORDINATE SYSTEM: NAD 1983 UTM Zone 9N





SPECIES CODES	SPECIES NAMES
ACT	Cutthroat Trout (Anadromous)
AO	All Salmon
AS	Atlantic Salmon
BH	Catfish (General)
BL	Western Brook Lamprey
BT	Bull Trout
CAL	Coastrange Sculpin
CAS	Prickly Sculpin
CBC	Chub (General)
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SP	Unidentified Species
SST	Steelhead (Summer-run)
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TSB	Threespine Stickleback

- Stream Crossing
- Road Crossing - New
- Road Crossing - Reconstruction
- FISS Observation Point
- FISS Obstacles

- Populated Place
- Existing Substation
- Existing Transmission Line
- Local Road
- Forest Service Road
- Existing Road
- Railway
- Contour (25m)
- Recreation Trail
- Stream
- LIDAR Streams
- Waterbody
- Wetland
- Recreation Site
- Lakelse Subzone 1
- Lakelse Subzone 2
- First Nation Reserve
- Park
- Private Parcel
- Sandhill Private Parcel
- Proposed Components
- Project Structure
- Provisional Route
- New Permanent Road
- New Temporary Road
- Reconstruction Road
- Transmission Line Right of Way (120m)
- Engineering Boundary
- Fisheries Local Study Area

CLIENT:

Prepared for BC Hydro

TITLE:

Appendix B.1  
Location of Watercourse Crossings  
within the Local Study Area

PROJECT:

Terrace to Kitimat  
Transmission Project (TKTP)

DATE:

October, 2016

ANALYST:

MY

QA/QC:

RS

Page 2 of 8

GIS FILE:

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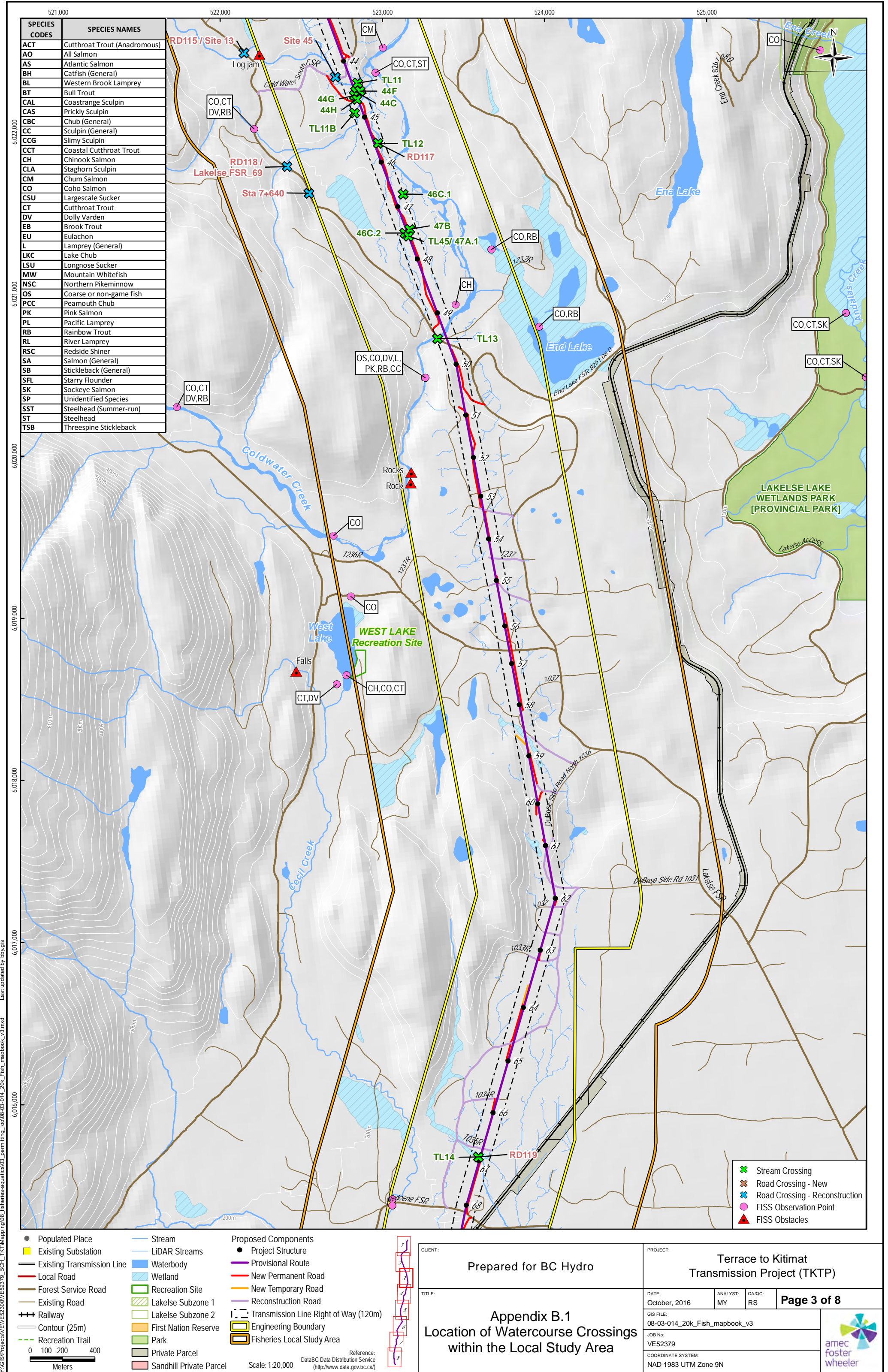
VE52379

COORDINATE SYSTEM:

NAD 1983 UTM Zone 9N

amec  
foster  
wheeler





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CLIENT:

Prepared for BC Hydro

TITLE:

Appendix B.1  
Location of Watercourse Crossings  
within the Local Study Area

PROJECT:

Terrace to Kitimat  
Transmission Project (TKTP)

DATE:

October, 2016

ANALYST:

MY

QA/QC:

RS

Page 3 of 8

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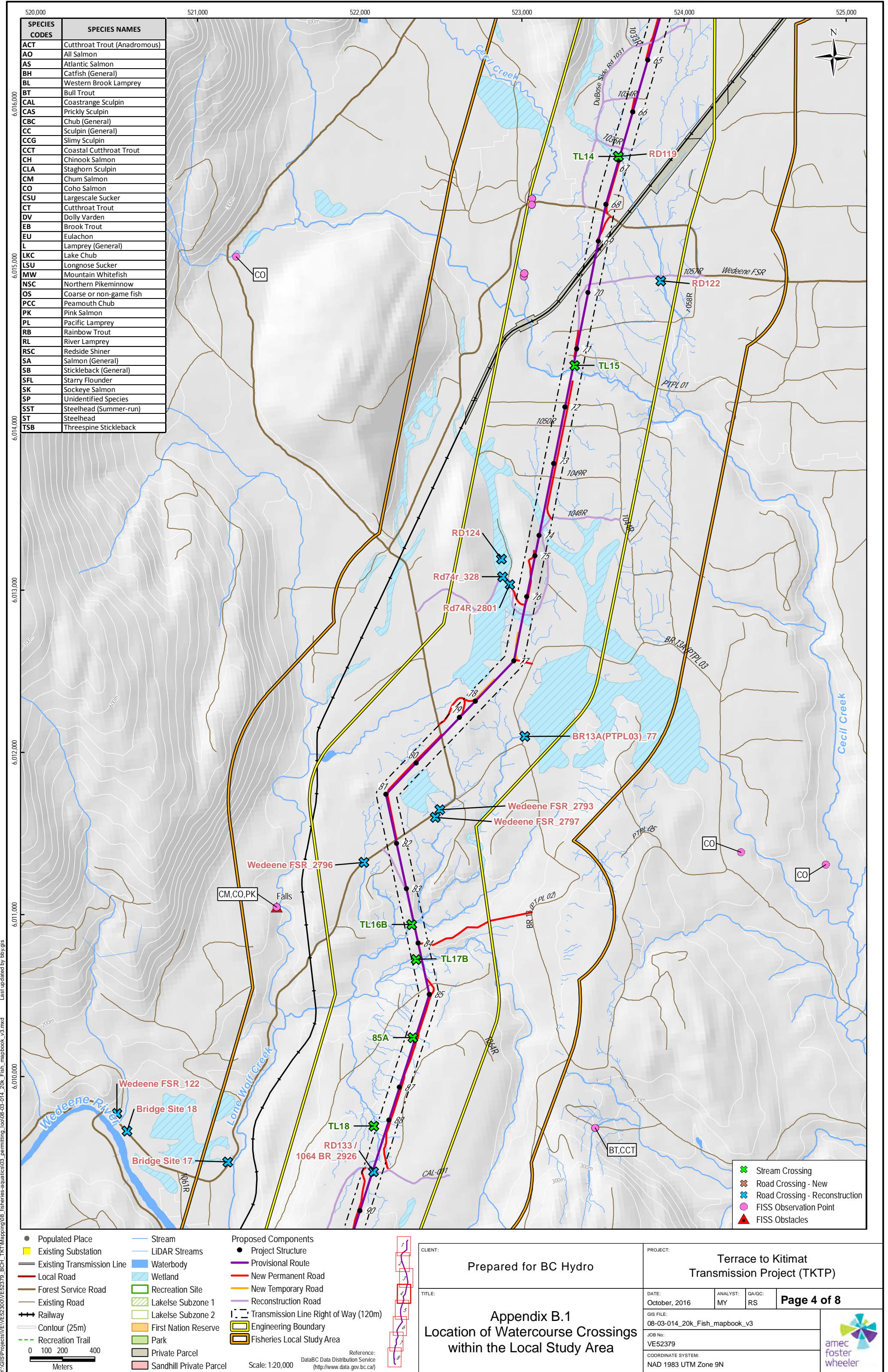
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VE52379

COORDINATE SYSTEM:

NAD 1983 UTM Zone 9N





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- Stream Crossing
- Road Crossing - New
- Road Crossing - Reconstruction
- FISS Observation Point
- FISS Obstacles

- Populated Place
  - Existing Substation
  - Existing Transmission Line
  - Local Road
  - Forest Service Road
  - Existing Road
  - Railway
  - Contour (25m)
  - Recreation Trail

- Stream
  - LIDAR Streams
  - Waterbody
  - Wetland
  - Recreation Site
  - Lakelse Subzone 1
  - Lakelse Subzone 2
  - First Nation Reserve
  - Park
  - Private Parcel
  - Sandhill Private Parcel

Proposed Components
  - Project Structure
  - Provisional Route
  - New Permanent Road
  - New Temporary Road
  - Reconstruction Road
  - Transmission Line Right of Way (120m)
  - Engineering Boundary
  - Fisheries Local Study Area

010200400

Meters

Scale: 1:20,000

Reference: DataBC Data Distribution Service (<http://www.data.gov.bc.ca/>)

12345678
- CLIENT: Prepared for BC Hydro

TITLE: Appendix B.1  
Location of Watercourse Crossings within the Local Study Area

PROJECT: Terrace to Kitimat Transmission Project (TKTP)

DATE: October, 2016

ANALYST: MY

QA/QC: RS

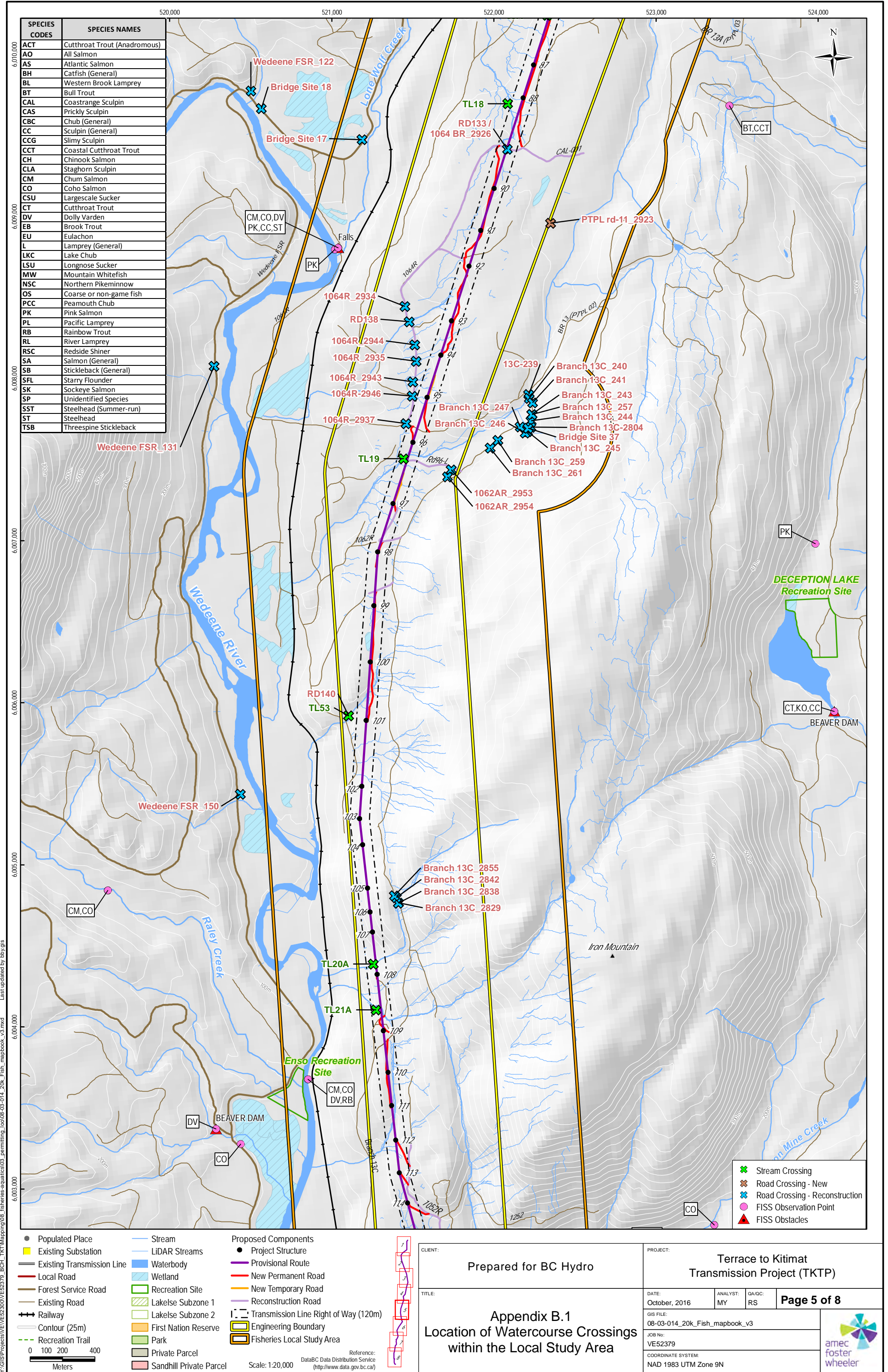
Page 4 of 8

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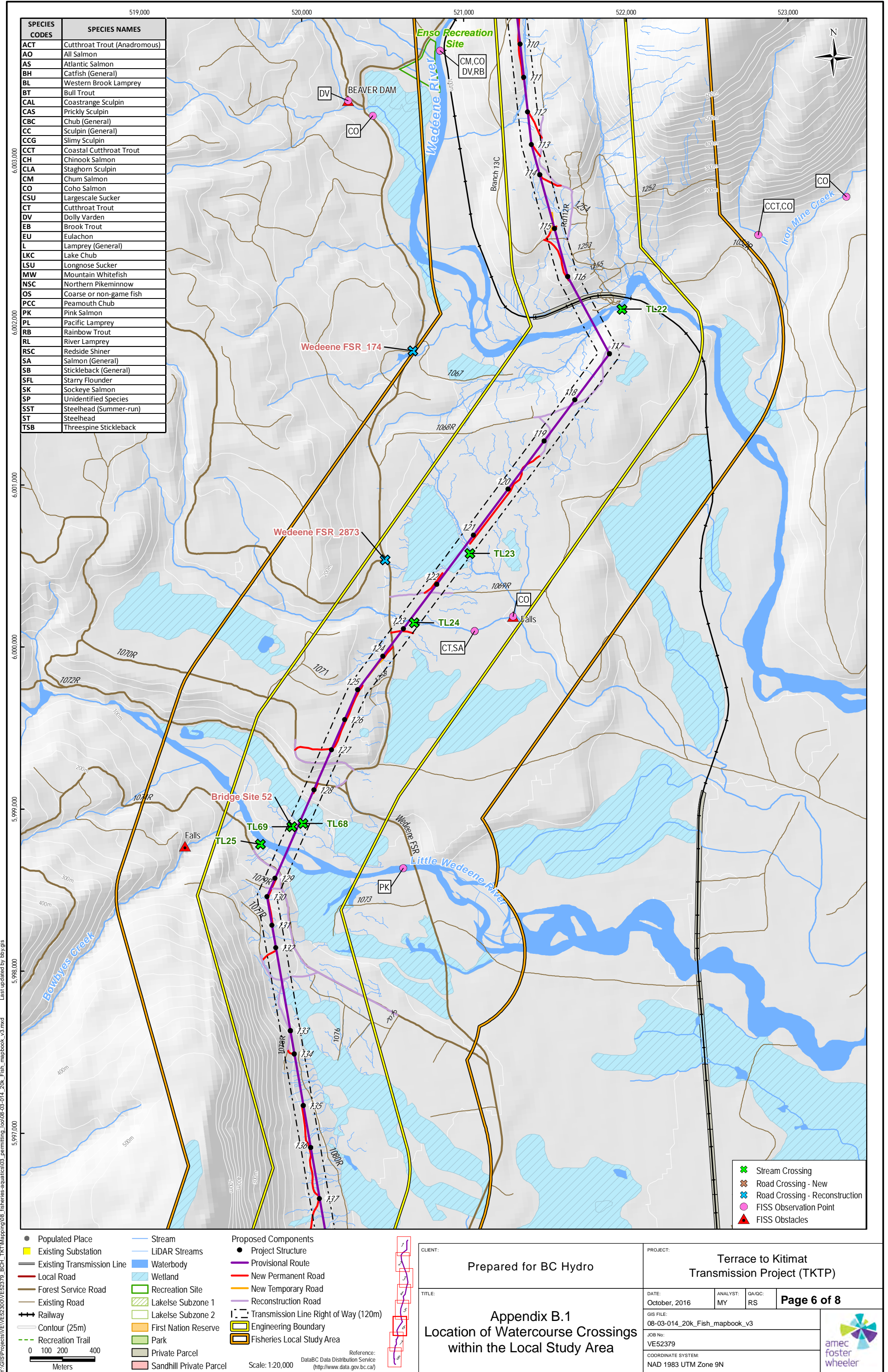
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COORDINATE SYSTEM: NAD 1983 UTM Zone 9N

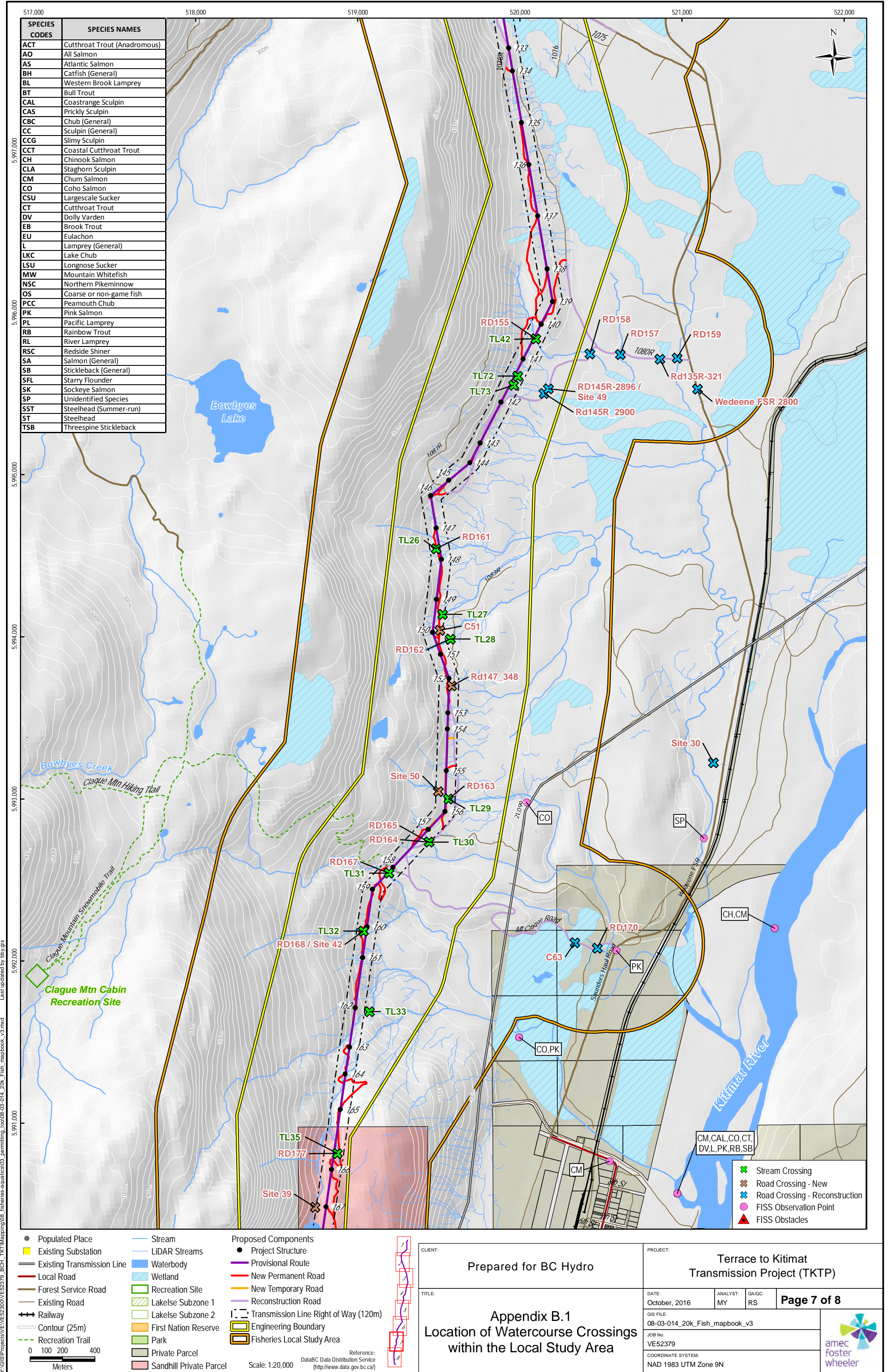












SPECIES CODES	SPECIES NAMES
ACT	Cutthroat Trout (Anadromous)
AO	All Salmon
AS	Atlantic Salmon
BH	Catfish (General)
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BT	Bull Trout
CAL	Coastrange Sculpin
CAS	Prickly Sculpin
CBC	Chub (General)
CC	Sculpin (General)
CCG	Slimy Sculpin
CCT	Coastal Cutthroat Trout
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CLA	Staghorn Sculpin
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CO	Coho Salmon
CSU	Largescale Sucker
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EB	Brook Trout
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L	Lamprey (General)
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SB	Stickleback (General)
SFL	Starry Flounder
SK	Sockeye Salmon
SP	Unidentified Species
SST	Steelhead (Summer-run)
ST	Steelhead
TSB	Threespine Stickleback

- Stream Crossing
- Road Crossing - New
- Road Crossing - Reconstruction
- FISS Observation Point
- FISS Obstacles

CLIENT:

Prepared for BC Hydro

TITLE:

Appendix B.1  
Location of Watercourse Crossings  
within the Local Study Area

PROJECT:

Terrace to Kitimat  
Transmission Project (TKTP)

DATE:

October, 2016

ANALYST:

MY

QA/QC:

RS

Page 7 of 8

GIS FILE:

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JOB No:

VE52379

COORDINATE SYSTEM:

NAD 1983 UTM Zone 9N

amec  
foster  
wheeler

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## **Appendix B.2**

### Aquatic Catalogue

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	11B			Structure No.	7	
Watershed Code:	No data		Stream Order	1				
Stream Name	Unnamed		Stream Class	S3				
Crew	IM, HC, JS		UTM_Zone	09	UTM Northing	6030961		
Survey Date	6/28/2016				UTM Easting	523496		
Time	15:28:02		Site Length (m)	150				
Channel	Dry Channel		Features	None				
Mean Channel Width (m)	1.95	Mean Wetted Width (m)	0.00	Mean Residual Pool Depth (m)		0.00		
Mean Gradient (%)	4	Dominate Substrate	Fines	Sub-dominate Substrate		Gravels		
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover		LWD, SWD		
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
<b>Riparian Vegetation</b>			Crown Closure		71-90%			
Left Bank Shape		Sloping		Right Bank Shape		Sloping		
Left Bank Texture		Fines		Right Bank Texture		Fines		
Left Bank Riparian Vegetation		Mixedwood		Right Bank Riparian Vegetation		Mixedwood		
Left Bank Stage		Young Forest		Right Bank Stage		Young Forest		
<b>Habitat Comments</b>	Fish Species	AO - All Salmonids						
Spawning	None - Very limited gravel, abundant fines clogging interstices.							
Rearing	Poor - Limited by lack of flows. Only provides rearing during freshet. Good cover availability.							
Overwintering	None - None, no deep pools, likely no water depths.							
Migration	Poor - No barriers identified, limited by flow depths, possible only during high water.							
<b>Fish Information</b>	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
<b>Photo Comments</b>								
Downstream extent of transects.								
<b>Site Comments</b>								
Dry channel, only potential for fish habitat during high flow periods. Fish may access site from downstream fish-bearing creek when water present, no barriers present. Downstream channel is well defined with alluvial materials present. Upstream of culvert, drainage becomes undefined, broad and damp area, with abundant skunk cabbage, poor to nil fish habitat. Culvert is wood log culvert, appears to allow water through. Potentially fish bearing during high flows.								
<b>Notes:</b>	<b>Cover</b>	<b>Fish Species</b>	<b>Stream Class</b>	<b>Non-fish bearing</b>				
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon	NCD and wetlands are non-fish bearing except where noted.				
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	14A			Structure No.	4	
Watershed Code:	No data		Stream Order	1				
Stream Name	Unnamed		Stream Class	S3				
Crew	HC, IM, JS		UTM_Zone	09	UTM Northing	6030192		
Survey Date	6/28/2016				UTM Easting	523581		
Time	10:51:54		Site Length (m)	100				
Channel	Dry Channel		Features	None				
Mean Channel Width (m)	1.82	Mean Wetted Width (m)	0.00	Mean Residual Pool Depth (m)		0.00		
Mean Gradient (%)	6	Dominate Substrate	Fines	Sub-dominate Substrate		Gravels		
In-stream Cover	Abundant	Dominant cover	LWD	Sub-dominant cover		SWD, OV		
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
<b>Riparian Vegetation</b>			Crown Closure		41-70%			
Left Bank Shape		Undercut	Right Bank Shape		Sloping			
Left Bank Texture		Fines	Right Bank Texture		Gravels			
Left Bank Riparian Vegetation		Coniferous	Right Bank Riparian Vegetation		Coniferous			
Left Bank Stage		Mature Forest	Right Bank Stage		Mature Forest			
<b>Habitat Comments</b>	Fish Species	AO - All Salmonids						
Spawning	None - Ephemeral stream where egg mortality is likely, given that the channel was dry during time of survey.							
Rearing	Poor - Poor flow connectivity may strand rearing fish during low water periods. Small channel area offers limited rearing area.							
Overwintering	None - Dry, no deep pools observed.							
Migration	Poor - Dry during survey. No migration potential during low-water periods. No permanent barriers to fish passage observed.							
<b>Fish Information</b>	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
<b>Photo Comments</b>								
Crossing location. Downstream extent of survey, showing the dry, defined channel.								
<b>Site Comments</b>								
Ephemeral, defined channel was dry during time of survey. Drainage likely has flow connectivity only during meltwater/runoff periods. Site is upstream of perched culvert barrier at the downstream railroad crossing.								
<b>Notes:</b>	<b>Cover</b>	<b>Fish Species</b>	<b>Stream Class</b>	<b>Non-fish bearing</b>				
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon	NCD and wetlands are non-fish bearing except where noted.				
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	24A	Structure No.	24			
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	Wetland					
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6028066			
Survey Date	6/29/2016			UTM Easting	521470			
Time	11:15:29	Site Length (m)	100					
Channel	Wetland	Features	None					
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)	No data			
Mean Gradient (%)	No data	Dominate Substrate	No data	Sub-dominate Substrate	No data			
In-stream Cover	No data	Dominant cover	No data	Sub-dominant cover	No data			
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
Riparian Vegetation					Crown Closure	No data		
Left Bank Shape	No data				Right Bank Shape	No data		
Left Bank Texture	No data				Right Bank Texture	No data		
Left Bank Riparian Vegetation	No data				Right Bank Riparian Vegetation	No data		
Left Bank Stage	No data				Right Bank Stage	No data		
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Yes	Species Captured-2016	NFC		Species Stage-2016	N/A		
Photo Comments	Crossing site overview.							
Site Comments	<p>Site consists of a series of open water wetland pools, separated by beaver dams and vegetated marsh sections. No channelization or scour observed. No flowing water, pools are connected by groundwater seep only. No overland flow. Organic substrates only, no alluvial material present. Abundant algal mats. Drainage offers no fish habitat.</p>							
Notes:	Cover	Fish Species			Stream Class			
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback		Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.		

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	25B	Structure No.	26
Watershed Code:	No data	Stream Order	1		
Stream Name	Unnamed	Stream Class	NCD		
Crew	HC, IM, JS	UTM_Zone	09	UTM Northing	6027584
Survey Date	6/29/2016			UTM Easting	521338
Time	12:26:31	Site Length (m)	100		
Channel	Non-classified Drainage	Features	None		
Mean Channel Width (m)	0.59	Mean Wetted Width (m)	0.00	Mean Residual Pool Depth (m)	0.00
Mean Gradient (%)	9	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A

Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
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Riparian Vegetation		Crown Closure	N/A
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Coniferous	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest

Habitat Comments	Fish Species	N/A
Spawning	N/A	
Rearing	N/A	
Overwintering	N/A	
Migration	N/A	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments	
At crossing location.	

Site Comments	
Intermittent channel definition present, fine substrates with few sections of gravel. Some isolated shallow pools present with depth <10 cm. Fish access restricted due to subsurface flow and lack of connection between any visible surface water. Non-fish bearing. No obvious barriers observed downstream where stream crosses track.	



Notes:	Cover	Fish Species	Stream Class	
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16




Crossing Type	Transmission Line	Site Number	44C	Structure No.	45
Watershed Code:	No data	Stream Order	1		
Stream Name	Unnamed	Stream Class	S3		
Crew	NN, DF, JR	UTM_Zone	09	UTM Northing	6022251
Survey Date	6/29/2016			UTM Easting	522835
Time	12:39:59	Site Length (m)	100		
Channel	Visible channel	Features	None		
Mean Channel Width (m)	1.72	Mean Wetted Width (m)	0.30	Mean Residual Pool Depth (m)	0.02
Mean Gradient (%)	1	Dominate Substrate	Fines	Sub-dominate Substrate	Fines
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	LWD, SWD

Water Quality	Temperature (Deg C)	14.3	pH	6.6	Conductivity (uS/cm)	37	Turbidity	C-Clear
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Riparian Vegetation		Crown Closure	71-90%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	None - No habitat. Fines for bed material, no coarse gravels.	
Rearing	Poor - Poor to moderate habitat for juveniles depending on water levels and time of year. Currently poor habitat due to low flow. Rated as poor but would upgrade to moderate in spring or fall.	
Overwintering	None - Too shallow no deep pools observed.	
Migration	Poor - Juveniles can migrate at high flows. Shallow isolated pools at present with no flow connecting the pools.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	CO	Species Stage-2016	Fry

Photo Comments	
View of dry channel at upper limit of survey.	

Site Comments	
Low energy stream, fine bed material with diverse cover. Moderate coho juvenile habitat. Cool water although shallow. No spawning or overwintering habitat. A trace of small gravels at the lower end of site. Coho juveniles viewed in pools, 2 captured.	

Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	44F	Structure No.	
Watershed Code:	No data	Stream Order	2		
Stream Name	Unnamed	Stream Class	S3		
Crew	NN, DF, JR	UTM_Zone	09	UTM Northing	6022253
Survey Date	6/29/2016			UTM Easting	522861
Time	14:21:23	Site Length (m)	100		
Channel	Visible channel	Features	None		
Mean Channel Width (m)	2.35	Mean Wetted Width (m)	0.93	Mean Residual Pool Depth (m)	0.03
Mean Gradient (%)	1	Dominate Substrate	Fines	Sub-dominate Substrate	Fines
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	SWD

Water Quality	Temperature (Deg C)	14.3	pH	6.9	Conductivity (uS/cm)	75	Turbidity	C-Clear
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Riparian Vegetation		Crown Closure	71-90%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	None - No habitat. No alluvial substrates.	
Rearing	Poor - Poor habitat due to poor connectivity to main channel. Lower 10 m connected with easy access near confluence with 44C.	
Overwintering	None - No deep pools observed.	
Migration	Poor - Poor migration at upper end of the site for juveniles fish.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments	
Photos of shallow standing water with coho fry observed near confluence with 44C.	

Site Comments	
Small channel that is connected to 44C. Coho observed downstream in 44C drainage.	



Notes:	Cover	Fish Species	Stream Class
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback
			Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m
			Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

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Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	44G			Structure No.	45																																
Watershed Code:	No data		Stream Order	1																																			
Stream Name	Unnamed		Stream Class	S4																																			
Crew	NN, DF, JR		UTM_Zone	09	UTM Northing	6022226																																	
Survey Date	6/29/2016				UTM Easting	522826																																	
Time	15:07:08		Site Length (m)	100																																			
Channel	Dry Channel		Features	None																																			
Mean Channel Width (m)	1.16	Mean Wetted Width (m)	0.00	Mean Residual Pool Depth (m)		0.00																																	
Mean Gradient (%)	2	Dominate Substrate	Fines	Sub-dominate Substrate		Gravels																																	
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover		LWD, SWD																																	
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data																															
Riparian Vegetation			Crown Closure		71-90%																																		
Left Bank Shape		Sloping		Right Bank Shape		Sloping																																	
Left Bank Texture		Fines		Right Bank Texture		Fines																																	
Left Bank Riparian Vegetation		Mixedwood		Right Bank Riparian Vegetation		Mixedwood																																	
Left Bank Stage		Mature Forest		Right Bank Stage		Mature Forest																																	
Habitat Comments	Fish Species	AO - All Salmonids																																					
Spawning	None - No gravels present.																																						
Rearing	Poor - Seasonal channel with limited size.																																						
Overwintering	None - No deep pools.																																						
Migration	Poor - Poor for migration although possible during higher water.																																						
Fish Information	Historical Fish Presence		No data																																				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A																																	
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A																																	
Photo Comments																																							
Dry channel in thick understory.																																							
Site Comments			Dry channel but when wetted would be poor to moderate for coho juveniles.																																				
Notes:			<div> <div> <b>Cover</b>  N/A Assessed but no data to report </div> <div> <b>Fish Species</b>  <table border="0"> <tr><td>AS</td><td>Atlantic salmon</td><td>DV</td><td>Dolly varden</td></tr> <tr><td>CC</td><td>Sculpins</td><td>L</td><td>Lamprey</td></tr> <tr><td>CCT</td><td>Coastal cutthroat trout</td><td>PK</td><td>Pink salmon</td></tr> <tr><td>CH</td><td>Chinook salmon</td><td>PL</td><td>Pacific Lamprey</td></tr> <tr><td>CM</td><td>Chum salmon</td><td>RB</td><td>Rainbow trout</td></tr> <tr><td>CO</td><td>Coho salmon</td><td>SA</td><td>Salmon</td></tr> <tr><td>CCG</td><td>Slimy sculpin</td><td>SK</td><td>Sockeye salmon</td></tr> <tr><td></td><td></td><td>TSB</td><td>Threespine stickleback</td></tr> </table> </div> <div> <b>Stream Class</b>  <b>Fish bearing</b>  S1 &gt; 20 m  S2 &gt; 5 m - 20 m  S3 1.5 m - 5 m  S4 &lt; 1.5 m  <b>Non-fish bearing</b>  S5 &gt; 3 m  S6 &lt; 3 m  NVC No visible channel  NCD Non-classified drainage  NCD and wetlands are non-fish bearing except where noted. </div> </div>					AS	Atlantic salmon	DV	Dolly varden	CC	Sculpins	L	Lamprey	CCT	Coastal cutthroat trout	PK	Pink salmon	CH	Chinook salmon	PL	Pacific Lamprey	CM	Chum salmon	RB	Rainbow trout	CO	Coho salmon	SA	Salmon	CCG	Slimy sculpin	SK	Sockeye salmon			TSB	Threespine stickleback
AS	Atlantic salmon	DV	Dolly varden																																				
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CCG	Slimy sculpin	SK	Sockeye salmon																																				
		TSB	Threespine stickleback																																				

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	44H	Structure No.	44
Watershed Code:	No data	Stream Order	2		
Stream Name	Unnamed	Stream Class	S3		
Crew	NN, DF, JR	UTM_Zone	09	UTM Northing	6022202
Survey Date	6/29/2016			UTM Easting	522842
Time	13:49:31	Site Length (m)	100		
Channel	Dry Channel	Features	None		
Mean Channel Width (m)	1.75	Mean Wetted Width (m)	0.00	Mean Residual Pool Depth (m)	0.00
Mean Gradient (%)	1	Dominate Substrate	Fines	Sub-dominate Substrate	Fines
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	LWD, SWD

Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
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Riparian Vegetation		Crown Closure	71-90%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	None - No alluvial substrates for spawning.	
Rearing	Poor - Coho could use this habitat at high water, based on proximity and potential connectivity to downstream observed rearing habitat.	
Overwintering	None - No pools observed.	
Migration	Poor - Some areas are poor for migration of juveniles due to dewatering or low flows. May be possible at higher flows.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A


Photo Comments	
View of dry channel.	


Site Comments	
Dry channel, habitat poor to moderate in the rainy season or spring snow melt.	





Notes:	Cover	Fish Species	Stream Class
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback
			Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m
			Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.



<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Transmission Line	Site Number	46C.1		Structure No.	47
Watershed Code:	No data		Stream Order	2		
Stream Name	Unnamed		Stream Class	S3		
Crew	NN, DF		UTM_Zone	09	UTM Northing	6021618
Survey Date	6/30/2016				UTM Easting	523130
Time	09:58:49		Site Length (m)	300		
Channel	Visible channel		Features	None		
Mean Channel Width (m)	2.62	Mean Wetted Width (m)	1.37	Mean Residual Pool Depth (m)		0.16
Mean Gradient (%)	1	Dominate Substrate	Fines	Sub-dominate Substrate		Cobbles
In-stream Cover	Moderate	Dominant cover	SWD	Sub-dominant cover		LWD, OV
Water Quality	Temperature (Deg C)	8.3	pH	6.6	Conductivity (uS/cm)	45
					Turbidity	C-Clear
Riparian Vegetation			Crown Closure		41-70%	
Left Bank Shape		Sloping	Right Bank Shape		Sloping	
Left Bank Texture		Fines	Right Bank Texture		Fines	
Left Bank Riparian Vegetation		Mixedwood	Right Bank Riparian Vegetation		Mixedwood	
Left Bank Stage		Mature Forest	Right Bank Stage		Mature Forest	
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	None - No gravels in surveyed area. All fine substrates and some boulders.					
Rearing	Poor - Wetted channel choked with algae and becomes dry further upstream.					
Overwintering	Poor - Limited flow and lacking deep pools. One large pool (approx 0.75m depth) at upstream extent may provide some overwintering habitat.					
Migration	Poor - Channel is wetted at downstream extent of transmission crossing but becomes dry further upstream. Beaver dam between tributaries creates a barrier during low flows.					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
Photo Comments						
<p>At the downstream limit of the transmission line crossing.</p>						
Site Comments						
<p>At downstream extent of survey area the channel is choked in algae and the bed material is predominantly fine and organic materials. Further upstream the channel becomes dry with areas of isolated pools. Coarse substrate is more common further upstream. Fish observed at the downstream extent of the site.</p>						
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	<u>Fish bearing</u>		
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S5 > 3 m	
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	S6 < 3 m	
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NVC No visible channel	
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD Non-classified drainage	
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon		NCD and wetlands are non-fish bearing except where noted.	
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback			

<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Transmission Line	Site Number	46C.2		Structure No.	48		
Watershed Code:	No data		Stream Order	2				
Stream Name	Unnamed		Stream Class	S2				
Crew	DF, NN	UTM_Zone	09	UTM Northing	6021378			
Survey Date	6/30/2016			UTM Easting	523138			
Time	13:46:19	Site Length (m)	100					
Channel	Visible channel		Features	BD - Beaver dam				
Mean Channel Width (m)	13.33	Mean Wetted Width (m)	8.67	Mean Residual Pool Depth (m)	0.77			
Mean Gradient (%)	0	Dominate Substrate	Fines	Sub-dominate Substrate	Fines			
In-stream Cover	Abundant	Dominant cover	LWD	Sub-dominant cover	SWD, DP, IV, OV			
Water Quality	Temperature (Deg C)	20.1	pH	6.4	Conductivity (uS/cm)	28	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	1-20%				
Left Bank Shape		Sloping	Right Bank Shape		Sloping			
Left Bank Texture		Fines	Right Bank Texture		Fines			
Left Bank Riparian Vegetation		Mixedwood	Right Bank Riparian Vegetation		Mixedwood			
Left Bank Stage		Young Forest	Right Bank Stage		Young Forest			
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No gravel or coarse substrate. Bed materials is organic and fine materials.							
Rearing	Moderate - Impoundments may provide rearing opportunities as they maintain water year round and provide high amounts of cover.							
Overwintering	Good - Sufficient depth for overwintering juveniles.							
Migration	Poor - Beaver dams create fish barriers during low flow seasons. Likely overtopped during higher flows.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments								
First beaver impoundment. Looking upstream at the next beaver dam.								
Site Comments			Reach 2 is defined by beaver activity creating a series of dams and impoundments. Cover is abundant from depth and woody debris that has entered the impoundments. One small beaver impoundment is in the transmission line right of way and a second, larger beaver is just upstream of the proposed transmission line right of way.					
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	PK Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	47B	Structure No.	71			
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	DF, NN	UTM_Zone	09	UTM Northing	6021401			
Survey Date	6/30/2016			UTM Easting	523170			
Time	11:40:15	Site Length (m)	100					
Channel	Dry Channel	Features	None					
Mean Channel Width (m)	2.02	Mean Wetted Width (m)	0.12	Mean Residual Pool Depth (m)	0.01			
Mean Gradient (%)	1	Dominate Substrate	Fines	Sub-dominate Substrate	Cobbles			
In-stream Cover	Moderate	Dominant cover	SWD	Sub-dominant cover	LWD, OV			
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
Riparian Vegetation			Crown Closure	41-70%				
Left Bank Shape	Sloping		Right Bank Shape	Sloping				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No gravel substrate. All fine materials.							
Rearing	Poor - Dry channel. Likely provides some rearing habitat during higher flows.							
Overwintering	None - No deep pools. Majority of channel dry at time of survey.							
Migration	Poor - Dry channel prevent migration. No other barriers observed.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Upstream extent of transmission line facing upstream.							
Site Comments	<p>Limited channel development at upstream end of the proposed transmission line right of way. Channel dry at time of survey. Bed material predominantly fine and organic materials however some cobble and gravel observed in downstream portion. Ferns and other shrubs growing along stream margins provide cover. Woody debris common in study area.</p>							
Notes:	Cover	Fish Species	Stream Class					
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.			



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

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Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	6A	Structure No.	12			
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	DF, NN	UTM_Zone	09	UTM Northing	6032244			
Survey Date	6/30/2016			UTM Easting	523556			
Time	17:10:01	Site Length (m)	100					
Channel	Visible channel	Features	None					
Mean Channel Width (m)	1.58	Mean Wetted Width (m)	0.38	Mean Residual Pool Depth (m)	0.04			
Mean Gradient (%)	6	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels			
In-stream Cover	Abundant	Dominant cover	SWD	Sub-dominant cover	LWD, DP, OV, UC			
Water Quality	Temperature (Deg C)	12.8	pH	8.5	Conductivity (uS/cm)	90	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	21-40%				
Left Bank Shape	Vertical		Right Bank Shape	Undercut				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Coniferous		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - Gravel substrates limited.							
Rearing	Poor - Channel not flowing at time of survey. Master course may provide rearing opportunities at higher flows.							
Overwintering	None - Low flow and no deep pools.							
Migration	Poor - Checked for barriers about halfway to confluence downstream. None observed. Sections of dry channel limit migration.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Downstream extent of survey, showing an intermittently dry channel with some small pools.							
Site Comments	Watercourse is a well-defined, intermittently wet stream. The upstream section is dominated by fine substrates and mostly dry at the time of survey. Some isolated pools are present. Near the downstream extent, the substrate has a greater proportion of gravel/cobble and more of the channel is wetted. Creek is confined by steep valley walls. Mature forest on top of valley. Stream may provide rearing and migration habitat during high-water periods. No barriers observed between survey site and downstream watercourses.							
Notes:	Cover	Fish Species	DV	Stream Class	Fish bearing	Non-fish bearing		
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	S1 > 20 m	S5 > 3 m			
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	DP Deep pools	CM Chum salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

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Project No VE52379

Date 28-Oct-16




Crossing Type	Transmission Line	Site Number	85A	Structure No.	86
Watershed Code:	No data	Stream Order	1		
Stream Name	Unnamed	Stream Class	S6		
Crew	NN, DF	UTM_Zone	09	UTM Northing	6010240
Survey Date	7/6/2016			UTM Easting	522328
Time	13:46:54	Site Length (m)	150		
Channel	Visible channel	Features	None		
Mean Channel Width (m)	0.57	Mean Wetted Width (m)	0.71	Mean Residual Pool Depth (m)	0.09
Mean Gradient (%)	16	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels
In-stream Cover	Abundant	Dominant cover	UC	Sub-dominant cover	LWD, SWD, OV

Water Quality	Temperature (Deg C)	7.9	pH	8.2	Conductivity (uS/cm)	68	Turbidity	C-Clear
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Riparian Vegetation		Crown Closure	21-40%
Left Bank Shape	Undercut	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Coniferous	Right Bank Riparian Vegetation	Coniferous
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	None - No spawning habitat, no gravels and limited channel area.	
Rearing	Poor - Some small drops and subsurface flow make this stream poor rearing potential for salmonids.	
Overwintering	None - No deep pools and small amount of flow at the time of survey.	
Migration	Poor - Migration potential for juveniles is poor due to subsurface flow and small drops. Adult migration is limited by low flow depths.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	NFC	Species Stage-2016	N/A

Photo Comments	
Site Comments	

View of channel near downstream end of site.

Some subsurface flow and small drops about 50 cm high. Becomes spread out in places upstream with some overland flow. Flow disappears downstream and goes subsurface for at least 30 m.

Notes:	Cover	Fish Species	Stream Class
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback
			Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m
			Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	9B		Structure No.	
Watershed Code:	No data		Stream Order	1		
Stream Name	Unnamed		Stream Class	NCD		
Crew	HC, IM, JS		UTM_Zone	09	UTM Northing	6031600
Survey Date	6/28/2016				UTM Easting	523592
Time	17:11:37		Site Length (m)	100		
Channel	Non-classified Drainage		Features	None		
Mean Channel Width (m)	0.71	Mean Wetted Width (m)	0.51	Mean Residual Pool Depth (m)	0.00	
Mean Gradient (%)	17	Dominate Substrate	Fines	Sub-dominate Substrate	Fines	
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A	
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data
					Turbidity	No data
Riparian Vegetation			Crown Closure	N/A		
Left Bank Shape	Vertical		Right Bank Shape	Vertical		
Left Bank Texture	Fines		Right Bank Texture	Fines		
Left Bank Riparian Vegetation	Coniferous		Right Bank Riparian Vegetation	Coniferous		
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest		
Habitat Comments	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
Photo Comments						
Taken at crossing location.						
Site Comments						
<p>Incised drainage with little to no surface water present at crossing location or surveyed reach. Approx 30 m upstream of crossing drainage channel disappears and ends at a pool of groundwater seep. No alluvial substrate materials present. High gradient. No fisheries access above crossing location and below crossing slumping banks nearly close channel and flow becomes subsurface. Very small drainage area and flows are likely minimal even during freshet. Small residual pools present and less than 5cm depth.</p>						
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	Fish bearing		
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S5 > 3 m	
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	S6 < 3 m	
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NVC No visible channel	
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD Non-classified drainage	
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon		NCD and wetlands are non-fish bearing except where noted.	
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback			

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL1	Structure No.	9			
Watershed Code:	400-181319-64198	Stream Order	N/A					
Stream Name	Unnamed	Stream Class	NVC					
Crew	IM, NN	UTM_Zone	09	UTM Northing	6033363			
Survey Date	6/16/2015			UTM Easting	523581			
Time	17:15:27	Site Length (m)	100					
Channel	No Visible Channel	Features	None					
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A			
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A			
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A			
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation			Crown Closure	N/A				
Left Bank Shape	N/A		Right Bank Shape	N/A				
Left Bank Texture	N/A		Right Bank Texture	N/A				
Left Bank Riparian Vegetation	N/A		Right Bank Riparian Vegetation	N/A				
Left Bank Stage	N/A		Right Bank Stage	N/A				
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	No visible channel, shallow depression area. Looking upslope.							
Site Comments	No scour or substrate present. No water.							
Notes:	Cover	Fish Species	DV	Dolly varden	Stream Class			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey		Fish bearing			Non-fish bearing
	LWD Large woody debris	CC Sculpins	PK Pink salmon		S1 > 20 m			S5 > 3 m
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey		S2 > 5 m - 20 m			S6 < 3 m
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout		S3 1.5 m - 5 m			NVC No visible channel
	DP Deep pools	CM Chum salmon	SA Salmon		S4 < 1.5 m			NCD Non-classified drainage
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					NCD and wetlands are non-fish
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					bearing except where noted.



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL10	Structure No.	31
Watershed Code:	400-174068-59390	Stream Order	1		
Stream Name	Unnamed	Stream Class	S2		
Crew	BH, IM	UTM_Zone	09	UTM Northing	6025902
Survey Date	6/26/2015			UTM Easting	521516
Time	14:24:31	Site Length (m)	100		
Channel	Visible Channel	Features	C- Cascade, CV - Culvert, BD - Beaver dam		
Mean Channel Width (m)	6.34	Mean Wetted Width (m)	2.65	Mean Residual Pool Depth (m)	0.11
Mean Gradient (%)	11	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels
In-stream Cover	Abundant	Dominant cover	IV	Sub-dominant cover	SWD, OV

Water Quality	Temperature (Deg C)	14.8	pH	7.6	Conductivity (uS/cm)	59	Turbidity	L-Lightly turbid
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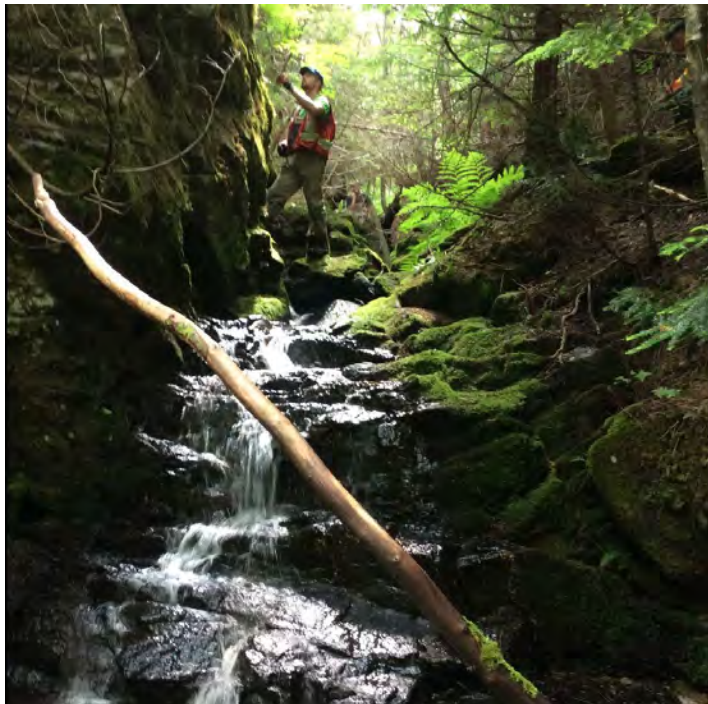
Riparian Vegetation		Crown Closure	21-40%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	Moderate - Patches of gravels are present downstream away from the influence of the upstream road crossing.	
Rearing	Moderate - Good cover and diversity, although limited by low flow depths.	
Overwintering	Poor - Limited by few, shallow pools at crossing site.	
Migration	Poor - No barrier between downstream habitat and crossing site. Bedrock cascades with low flow and high gradient present upstream of TL10 crossing.	

Fish Information	Historical Fish Presence		CCT, PK		
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	CCT	Species Stage-2016	Juvenile

**Photo Comments**  
Looking upstream towards the barrier site upstream of the crossing site.

**Site Comments**  
There are two bedrock chute/cascades upstream of the transmission line crossing towards site RD114 / Bridge Site 38. Gradient in the chutes is high (>20%) with two cascade drops of approximately 2 m and is a barrier to fish passage. Morphology at the TL10 crossing is bedrock chute habitat for about 40 meters before flowing in a cobble gravel stream. Electrofishing and minnow trapping upstream habitat did not capture any fish in 2015 or 2016. Electrofishing was conducted in the pool immediately below the barrier in 2016 and a cutthroat trout was captured quickly. The stream is therefore rated as fish-bearing up to the barrier and at the TL10 crossing site.



<b>Notes:</b> N/A Assessed but no data to report	<b>Cover</b> SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	<b>Fish Species</b> AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<b>Stream Class</b> <u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.
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# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro


Project No VE52379


Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL11	Structure No.	45			
Watershed Code:	400-174068-59390	Stream Order	3					
Stream Name	Unnamed	Stream Class	S2					
Crew	IM, BH, KE, PG	UTM_Zone	09	UTM Northing	6022301			
Survey Date	6/26/2015			UTM Easting	522847			
Time	09:01:38	Site Length (m)	100					
Channel	Visible Channel	Features	BG - Crossing, general					
Mean Channel Width (m)	10.40	Mean Wetted Width (m)	7.77	Mean Residual Pool Depth (m)	0.65			
Mean Gradient (%)	2	Dominate Substrate	Cobbles	Sub-dominate Substrate	Gravels			
In-stream Cover	Abundant	Dominant cover	DP	Sub-dominant cover	LWD, SWD, B, UC			
Water Quality	Temperature (Deg C)	10.6	pH	7.3	Conductivity (uS/cm)	20	Turbidity	C-Clear
Riparian Vegetation		Crown Closure	41-70%					
Left Bank Shape	Undercut	Right Bank Shape	Undercut					
Left Bank Texture	Gravels	Right Bank Texture	Gravels					
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood					
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest					
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Excellent - Abundant gravels, riffle pool sequences, good gravel variety.							
Rearing	Excellent - High cover, excellent pool habitats, good habitat variety, many fry and parr observed.							
Overwintering	Excellent - Abundant deep pools, good flow, good oxidation from small step pools.							
Migration	Excellent - No barriers, deep flows for all species, moderate flow velocities, many resting pools.							
Fish Information	Historical Fish Presence	CO, CCT, DV, RB, CM, ST						
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Crossing site looking downstream.							
Site Comments	Overall excellent stream for all life stages, excellent diversity of habitats, good substrate variety, abundant refugia, high cover, deep pools abundant. Abundant young of the year coho observed.							
Notes:	Cover	Fish Species		Stream Class				
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.			



<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Transmission Line	Site Number	TL11B	Structure No.	45			
Watershed Code:	400-174068-59390	Stream Order	2					
Stream Name	Unnamed	Stream Class	S2					
Crew	BH, IM	UTM_Zone	09	UTM Northing	6022118			
Survey Date	6/26/2015			UTM Easting	522828			
Time	09:55:51	Site Length (m)	100					
Channel	Visible channel	Features	None					
Mean Channel Width (m)	6.02	Mean Wetted Width (m)	3.99	Mean Residual Pool Depth (m)	0.22			
Mean Gradient (%)	3	Dominate Substrate	Cobbles	Sub-dominate Substrate	Gravels			
In-stream Cover	Abundant	Dominant cover	LWD	Sub-dominant cover	SWD, DP,UC			
Water Quality	Temperature (Deg C)	12.5	pH	6.8	Conductivity (uS/cm)	35	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	41-70%				
Left Bank Shape	Sloping		Right Bank Shape	Undercut				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Good - Abundant gravels in riffles and pool tail outs.							
Rearing	Good - Lots of shallow pools, undercuts, and functional large woody debris.							
Overwintering	Moderate - Deep pools are rare. Most pools are <50 cm deep.							
Migration	Good - No obvious barriers to adults in this site. No barriers to juveniles at any flow.							
Fish Information	Historical Fish Presence	-						
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments								
Looking downstream from top of site.								
Site Comments		<p>Good-quality salmon and trout stream. Well defined channel with diverse habitat types and abundant cover. Good spawning habitat on gravel side-channel bars. Salmon fry visible in pools and along margins.</p>						
Notes:	Cover	Fish Species	Stream Class		Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.			

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL12	Structure No.
Watershed Code:	400-174068-59390	Stream Order	2	
Stream Name	Unnamed	Stream Class	S3	
Crew	BH, IM	UTM_Zone	09	UTM Northing 6021931
Survey Date	6/26/2015			UTM Easting 522974
Time	10:50:16	Site Length (m)	100	
Channel	Visible Channel	Features	None	
Mean Channel Width (m)	3.48	Mean Wetted Width (m)	2.75	Mean Residual Pool Depth (m) 0.17
Mean Gradient (%)	1	Dominate Substrate	Fines	Sub-dominate Substrate Gravels
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover SWD, DP,UC

Water Quality	Temperature (Deg C)	12.4	pH	7.5	Conductivity (uS/cm)	21	Turbidity	C-Clear
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Riparian Vegetation		Crown Closure	41-70%
Left Bank Shape	Undercut	Right Bank Shape	Undercut
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	Moderate - Low water depths currently limit gravel availability, gravels would likely be submerged at high flow. Likely good for coastal cutthroat trout spawning.	
Rearing	Moderate - Good cover in pools but low flow.	
Overwintering	Poor - Shallow low flow pools. Likely low dissolved oxygen in stagnant pools.	
Migration	Poor - Poor for adult fish due to low flow. Juveniles migration is not limited.	

Fish Information	Historical Fish Presence	No data
Fished -2015	No	Species Captured-2015 N/A
Fished -2016	Not visited	Species Captured-2016 N/A

Photo Comments	
Crossing site looking downstream.	

Site Comments	
TL12 site was assessed downstream of actual crossing site. Channel characteristics are the same at the crossing site and the assessed site. Channel meanders significantly more than is marked on the FWA 20k map. Red algae present throughout site, coating channel substrates.	



Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL13	Structure No.	12			
Watershed Code:	400-174068-59390	Stream Order	4					
Stream Name	Coldwater Creek	Stream Class	S1					
Crew	BH, IM	UTM_Zone	09	UTM Northing	6020727			
Survey Date	6/25/2015			UTM Easting	523339			
Time	14:37:41	Site Length (m)	100					
Channel	Visible Channel	Features	BR - Bridge					
Mean Channel Width (m)	21.75	Mean Wetted Width (m)	15.25	Mean Residual Pool Depth (m)	0.00			
Mean Gradient (%)	3	Dominate Substrate	Boulders	Sub-dominate Substrate	Cobbles			
In-stream Cover	Moderate	Dominant cover	B	Sub-dominant cover	OV			
Water Quality	Temperature (Deg C)	8.9	pH	7.7	Conductivity (uS/cm)	21	Turbidity	L-Lightly turbid
Riparian Vegetation		Crown Closure	1-20%					
Left Bank Shape	Sloping	Right Bank Shape	Sloping					
Left Bank Texture	Cobbles	Right Bank Texture	Cobbles					
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood					
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest					
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Good - Main stem is too fast and rocky for spawning but dry side channel may be good habitat at higher flow.							
Rearing	Poor - Only along the margins due to very fast flow. Behind boulders but not in thalweg.							
Overwintering	Poor - Pools are scarce at the particular site. Habitat is almost exclusively a rapid.							
Migration	Good - Adults could pass at current flow using boulders as refugia from strong current.							
Fish Information	Historical Fish Presence	DV, CC, RB, AS, PK, CO, CH, L,						
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Taken from bridge looking downstream.							
Site Comments	Deep fast-flowing creek.							
Notes:	Cover	Fish Species		Stream Class				
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.			

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro


Project No VE52379


Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL14	Structure No.	6																	
Watershed Code:	910-665062-30171	Stream Order	N/A																			
Stream Name	Unnamed	Stream Class	NVC																			
Crew	BH, IM	UTM_Zone	09	UTM Northing	6015677																	
Survey Date	6/25/2015			UTM Easting	523593																	
Time	13:39:26	Site Length (m)	100																			
Channel	No Visible Channel	Features	None																			
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A																	
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A																	
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A																	
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A														
Riparian Vegetation			Crown Closure	N/A																		
Left Bank Shape			N/A	Right Bank Shape	N/A																	
Left Bank Texture			N/A	Right Bank Texture	N/A																	
Left Bank Riparian Vegetation			N/A	Right Bank Riparian Vegetation	N/A																	
Left Bank Stage			N/A	Right Bank Stage	N/A																	
Habitat Comments	Fish Species	N/A																				
Spawning	N/A																					
Rearing	N/A																					
Overwintering	N/A																					
Migration	N/A																					
Fish Information	Historical Fish Presence	No data																				
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A																	
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A																	
Photo Comments																						
Thick vegetation, no watercourse.																						
Site Comments																						
No channel present at crossing location.																						
Notes:			<div> <div> <b>Cover</b>  N/A Assessed but no data to report </div> <div> <b>Fish Species</b>  <table> <tr><td>AS</td><td>Atlantic salmon</td></tr> <tr><td>CC</td><td>Sculpins</td></tr> <tr><td>CCT</td><td>Coastal cutthroat trout</td></tr> <tr><td>CH</td><td>Chinook salmon</td></tr> <tr><td>CM</td><td>Chum salmon</td></tr> <tr><td>CO</td><td>Coho salmon</td></tr> <tr><td>CCG</td><td>Slimy sculpin</td></tr> </table> </div> <div> <b>Stream Class</b>  <b>Fish bearing</b>  S1 &gt; 20 m  S2 &gt; 5 m - 20 m  S3 1.5 m - 5 m  S4 &lt; 1.5 m  <b>Non-fish bearing</b>  S5 &gt; 3 m  S6 &lt; 3 m  NVC No visible channel  NCD Non-classified drainage  NCD and wetlands are non-fish bearing except where noted. </div> </div>						AS	Atlantic salmon	CC	Sculpins	CCT	Coastal cutthroat trout	CH	Chinook salmon	CM	Chum salmon	CO	Coho salmon	CCG	Slimy sculpin
AS	Atlantic salmon																					
CC	Sculpins																					
CCT	Coastal cutthroat trout																					
CH	Chinook salmon																					
CM	Chum salmon																					
CO	Coho salmon																					
CCG	Slimy sculpin																					



<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Transmission Line	Site Number	TL15	Structure No.	49
Watershed Code:	910-665062-30171		Stream Order	3	
Stream Name	Cecil Creek		Stream Class	S2	
Crew	BH, IM		UTM_Zone	09	UTM Northing 6014388
Survey Date	6/25/2015			UTM Easting	523324
Time	11:16:40		Site Length (m)	100	
Channel	Visible Channel		Features	X - LWD jam	
Mean Channel Width (m)	9.41	Mean Wetted Width (m)	9.18	Mean Residual Pool Depth (m)	0.41
Mean Gradient (%)	2	Dominate Substrate	Gravels	Sub-dominate Substrate	Cobbles
In-stream Cover	Abundant	Dominant cover	LWD	Sub-dominant cover	SWD, DP, OV, UC
Water Quality	Temperature (Deg C)	8.4	pH	6.9	Conductivity (uS/cm) 50
					Turbidity C-Clear
Riparian Vegetation			Crown Closure	21-40%	
Left Bank Shape	Undercut		Right Bank Shape	Undercut	
Left Bank Texture	Gravels		Right Bank Texture	Gravels	
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood	
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest	
Habitat Comments	Fish Species	AO - All Salmonids			
Spawning	Excellent - Excellent gravels in riffle and pool tailouts.				
Rearing	Excellent - Lots of cover variety available for juveniles.				
Overwintering	Excellent - Deep pools with sufficient depth exist throughout the channel.				
Migration	Good - Adults could pass even at flows observed. No barriers to juveniles observed.				
Fish Information	Historical Fish Presence	No data			
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A
Photo Comments					
Big pool at top of site looking upstream.					
Site Comments			<p>Beautiful trout and salmon stream. Excellent spawning habitat and lots of cover for fry and juveniles. Observed schools of salmon parr along the margins and in the pools behind large woody debris.</p>		
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	<u>Fish bearing</u>	S5 > 3 m
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S6 < 3 m
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	NVC No visible channel
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NCD Non-classified drainage
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD and wetlands are non-fish bearing except where noted.
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon		
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback		

# Terrace to Kitimat Transmission Project (TKTP)


## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro


Project No VE52379


Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL16B	Structure No.	84			
Watershed Code:	910-665062-20282	Stream Order	2					
Stream Name	Unnamed	Stream Class	S3					
Crew	NN, DF	UTM_Zone	09	UTM Northing	6010938			
Survey Date	7/5/2016			UTM Easting	522320			
Time	12:28:28	Site Length (m)	130					
Channel	Visible channel	Features	None					
Mean Channel Width (m)	2.83	Mean Wetted Width (m)	2.84	Mean Residual Pool Depth (m)	0.34			
Mean Gradient (%)	1	Dominate Substrate	Fines	Sub-dominate Substrate	Fines			
In-stream Cover	Moderate	Dominant cover	UC	Sub-dominant cover	LWD, SWD, DP, IV, OV			
Water Quality	Temperature (Deg C)	11.7	pH	8.0	Conductivity (uS/cm)	42	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	21-40%				
Left Bank Shape	Undercut		Right Bank Shape	Sloping				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Coniferous				
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No spawning gravels.							
Rearing	Good - Good rearing habitat for fish 0+ to 2+ year age classes.							
Overwintering	Moderate - Some deep pools for overwintering are available at the site.							
Migration	Good - No obstructions to fish migration were observed.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Yes	Species Captured-2016	CO	Species Stage-2016	Fry			
Photo Comments	View of channel near upper end of survey.							
Site Comments	Abundant cover and moderate flows with cool water make this an excellent rearing stream for young salmonids. Mature forest with canopy gaps. Some areas are more shaded than others. Good large woody debris recruitment here.							
								
Notes:	Cover	Fish Species	DV	Stream Class	Fish bearing	Non-fish bearing		
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	S1 > 20 m	S5 > 3 m	NVC No visible channel		
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m	NCD Non-classified drainage		
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S3 1.5 m - 5 m		NCD and wetlands are non-fish		
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S4 < 1.5 m		bearing except where noted.		
	DP Deep pools	CM Chum salmon	SA Salmon					
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					



<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	


Crossing Type	Transmission Line	Site Number	TL17B		Structure No.	84
Watershed Code:	910-665062-20282		Stream Order	2		
Stream Name	Unnamed		Stream Class	S2		
Crew	NN, DF		UTM_Zone	09	UTM Northing	6010724
Survey Date	7/5/2016				UTM Easting	522348
Time	14:45:04		Site Length (m)	120		
Channel	Visible channel		Features	None		
Mean Channel Width (m)	5.43	Mean Wetted Width (m)	2.35	Mean Residual Pool Depth (m)		0.32
Mean Gradient (%)	2	Dominate Substrate	Cobbles	Sub-dominate Substrate		Gravels
In-stream Cover	Abundant	Dominant cover	LWD	Sub-dominant cover		SWD, B, DP, OV, UC
Water Quality	Temperature (Deg C)	11.7	pH	8.2	Conductivity (uS/cm)	93
					Turbidity	C-Clear
Riparian Vegetation			Crown Closure		41-70%	
Left Bank Shape		Sloping	Right Bank Shape		Undercut	
Left Bank Texture		Cobbles	Right Bank Texture		Gravels	
Left Bank Riparian Vegetation		Mixedwood	Right Bank Riparian Vegetation		Mixedwood	
Left Bank Stage		Mature Forest	Right Bank Stage		Mature Forest	
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	Moderate - Gravels bars are present as well as holding areas for trout and salmon.					
Rearing	Good - Diverse cover, cool water and mature forest make this stream good for salmon and trout rearing.					
Overwintering	Good - Deep pools are abundant for overwintering juvenile salmonids. Deep pools coupled with small and large woody debris offer good cover as well for overwintering fish.					
Migration	Good - There are no obstructions to migration. Good for all life stages.					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Yes	Species Captured-2015	CO, DV, CCT		Species Stage-2015	Fry, Parr, Adult
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
Photo Comments						
View of stream at lower end of site.						
Site Comments						
<p>This is a good quality stream with consistent cool water flow. Diverse channel with all cover types for trout and salmon.</p> <p>Sampling conducted in 2015 captured coho salmon, Dolly Varden and coastal cutthroat trout. Juveniles observed during 2016 assessment.</p>						
Notes:	Cover	Fish Species	Stream Class			
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback		Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.	

# Freshwater Fish and Fish Habitat Catalog

Project No	VE52379
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Date	28-Oct-16
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Crossing Type		Transmission Line		Site Number		TL18		Structure No.		88													
Watershed Code:		910-665062-20282				Stream Order		1															
Stream Name		Unnamed				Stream Class		S6															
Crew		IM, BH, KE, PG				UTM_Zone		09		UTM Northing 6009696													
Survey Date		6/24/2015						UTM Easting		522085													
Time		11:16:40				Site Length (m)		100															
Channel		Visible Channel				Features		None															
Mean Channel Width (m)		2.60		Mean Wetted Width (m)		1.53		Mean Residual Pool Depth (m)		0.22													
Mean Gradient (%)		0		Dominate Substrate		Fines		Sub-dominate Substrate		Gravels													
In-stream Cover		Abundant		Dominant cover		OV		Sub-dominant cover		DP, IV,													
Water Quality		Temperature (Deg C)		12.4		pH		7.2		Conductivity (uS/cm)		15		Turbidity		C-Clear							
Riparian Vegetation						Crown Closure						41-70%											
Left Bank Shape				Sloping				Right Bank Shape						Sloping									
Left Bank Texture				Fines				Right Bank Texture						Fines									
Left Bank Riparian Vegetation				Mixedwood				Right Bank Riparian Vegetation						Mixedwood									
Left Bank Stage				Pole/Sapling				Right Bank Stage						Pole/Sapling									
Habitat Comments		Fish Species		AO - All Salmonids																			
Spawning		None - No adequate gravels, no flow rate, stagnant pools, likely low dissolved oxygen.																					
Rearing		None - No flows, stagnant pools, poor connectivity, likely low dissolved oxygen.																					
Overwintering		None - Stagnant pools, low dissolved oxygen in winter.																					
Migration		None - Isolated pools, no connection between pools.																					
Fish Information		Historical Fish Presence				No data																	
Fished -2015		No		Species Captured-2015				N/A				Species Stage-2015				N/A							
Fished -2016		Not visited		Species Captured-2016				N/A				Species Stage-2016				N/A							
Photo Comments																							
Crossing site.																							
Site Comments																							
No fish habitat, no fish access. Stagnant, disconnected pools. Likely low dissolved oxygen. No observed flow rate. Not fished.																							
Notes:																							
N/A Assessed but no data to report																							
Cover						Fish Species						Stream Class											
SWD Small woody debris						AS Atlantic salmon						Fish bearing						Non-fish bearing					
LWD Large woody debris						CC Sculpins						S1 > 20 m						S5 > 3 m					
B Boulder						CCT Coastal cutthroat trout						S2 > 5 m - 20 m						S6 < 3 m					
UC Undercut bank						CH Chinook salmon						S3 1.5 m - 5 m						NVC No visible channel					
DP Deep pools						CM Chum salmon						S4 < 1.5 m						NCD Non-classified drainage					
OV Overhanging vegetation						CO Coho salmon												NCD and wetlands are non-fish bearing except where noted.					
IV Instream vegetation						CCG Slimy sculpin																	
						DV Dolly varden																	
						L Lamprey																	
						PK Pink salmon																	
						PL Pacific Lamprey																	
						RB Rainbow trout																	
						SA Salmon																	
						SK Sockeye salmon																	
						TSR Threespine stickleback																	



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL19	Structure No.	96
Watershed Code:	910-665062-20282	Stream Order	1		
Stream Name	Unnamed	Stream Class	S3		
Crew	BH, IM	UTM_Zone	09	UTM Northing	6007506
Survey Date	6/23/2015			UTM Easting	521442
Time	10:35:18	Site Length (m)	100		
Channel	Visible Channel	Features	None		
Mean Channel Width (m)	3.59	Mean Wetted Width (m)	2.84	Mean Residual Pool Depth (m)	0.20
Mean Gradient (%)	7	Dominate Substrate	Cobbles	Sub-dominate Substrate	Gravels
In-stream Cover	Moderate	Dominant cover	B	Sub-dominant cover	SWD, DP

Water Quality	Temperature (Deg C)	11.0	pH	7.0	Conductivity (uS/cm)	52	Turbidity	C-Clear
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Riparian Vegetation		Crown Closure	71-90%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Gravels	Right Bank Texture	Gravels
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	Good - Limited only by relatively shallow depth and narrow width at high flows.	
Rearing	Excellent - Excellent quality spawning and rearing habitat for coho salmon and cutthroat trout.	
Overwintering	Moderate - Limited only by relative scarcity of deep pools. Suitable pools do exist for salmon and trout parr however .	
Migration	Good - No barriers observed in surveyed section. Only limited by low flow in summer and winter.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Yes	Species Captured-2015	CCT, CO	Species Stage-2015	Parr, Fry
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A

**Photo Comments**  
Looking upstream at top of site.

**Site Comments**  
Stream is excellent trout and coho salmon rearing and spawning habitat. Good habitat variety, pools, riffles, steps. Presence of coho salmon parr indicates no barrier further downstream to Wedeene River. Many fry observed in pools.



<b>Notes:</b> N/A Assessed but no data to report	<b>Cover</b> SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	<b>Fish Species</b> AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<b>Stream Class</b> <u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.
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# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL2	Structure No.
Watershed Code:	400-174068-34330	Stream Order	2	
Stream Name	Unnamed	Stream Class	S3	
Crew	IM, NN	UTM_Zone	09	UTM Northing 6032612
Survey Date	6/16/2015			UTM Easting 523608
Time	15:42:44	Site Length (m)	100	
Channel	Visible Channel	Features	None	
Mean Channel Width (m)	4.80	Mean Wetted Width (m)	3.21	Mean Residual Pool Depth (m) 0.31
Mean Gradient (%)	2	Dominate Substrate	Fines	Sub-dominate Substrate Gravels
In-stream Cover	Abundant	Dominant cover	SWD	Sub-dominant cover LWD, DP, OV
Water Quality	Temperature (Deg C)	No data	pH	No data
			Conductivity (uS/cm)	No data
				Turbidity
				No data
Riparian Vegetation		Crown Closure	41-70%	
Left Bank Shape	Sloping	Right Bank Shape	Sloping	
Left Bank Texture	Fines	Right Bank Texture	Fines	
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood	
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest	
Habitat Comments	Fish Species	AO - All Salmonids		
Spawning	Moderate - Some pea-sized spawning gravel in riffles and pool tail outs.			
Rearing	Excellent - Good cover levels and variety, habitat type variety, many holding and feeding areas.			
Overwintering	Good - Some deep pools, good flows.			
Migration	Excellent - No barriers, good flows.			
Fish Information	Historical Fish Presence	No data		
Fished -2015	Yes	Species Captured-2015	RB, CCT	Species Stage-2015 Adult, Parr
Fished -2016	Yes	Species Captured-2016	CCT	Species Stage-2016 Parr, Juvenile
Photo Comments	Crossing site looking downstream.			
Site Comments	Good fish stream, high diversity in cover and habitat units. Lots of cover. Salmonid rearing and spawning habitat.			
Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL20A	Structure No.	108
Watershed Code:	No data	Stream Order	1		
Stream Name	Unnamed	Stream Class	S6		
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6004388
Survey Date	6/30/2016			UTM Easting	521255
Time	10:54:47	Site Length (m)	100		
Channel	Other	Features	None		
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)	No data
Mean Gradient (%)	40	Dominate Substrate	No data	Sub-dominate Substrate	No data
In-stream Cover	No data	Dominant cover	No data	Sub-dominant cover	No data

Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
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Riparian Vegetation		Crown Closure	No data
Left Bank Shape	No data	Right Bank Shape	No data
Left Bank Texture	No data	Right Bank Texture	No data
Left Bank Riparian Vegetation	Coniferous	Right Bank Riparian Vegetation	Coniferous
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest

Habitat Comments	Fish Species	N/A
Spawning	N/A	
Rearing	N/A	
Overwintering	N/A	
Migration	N/A	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A

### Photo Comments

Barrier site, steep above and below marked site.

### Site Comments

Very steep mountain stream. Water is flowing, small pools present, many cascades. At survey point downstream of transmission line crossing site, stream is very steep, average of 40% gradient. Channel jammed with woody debris, abundant small and large wood in channel, boulder/bedrock substrates. No fish access potential, no fish.



<b>Notes:</b> N/A Assessed but no data to report	<b>Cover</b> SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	<b>Fish Species</b> AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<b>Stream Class</b> <u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.
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# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL21A	Structure No.	109			
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	S6					
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6004106			
Survey Date	6/30/2016			UTM Easting	521272			
Time	10:12:23	Site Length (m)	100					
Channel	Other	Features	None					
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)	No data			
Mean Gradient (%)	40	Dominate Substrate	No data	Sub-dominate Substrate	No data			
In-stream Cover	No data	Dominant cover	No data	Sub-dominant cover	No data			
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
Riparian Vegetation			Crown Closure	No data				
Left Bank Shape	No data		Right Bank Shape	No data				
Left Bank Texture	No data		Right Bank Texture	No data				
Left Bank Riparian Vegetation	Coniferous		Right Bank Riparian Vegetation	Coniferous				
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest				
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Barrier site, steep above and below marked site.							
Site Comments	<p>Very steep mountain stream. Water is flowing, small pools present, many cascades. Large cascade barrier at survey point downstream of transmission crossing site. 50 m long cascade jammed with woody debris, measured 42 % gradient. Abundant wood in channel, large cobble/boulder substrates. No fish access potential, no fish.</p>							
Notes:	Cover	Fish Species	DV	Stream Class	Fish bearing	Non-fish bearing		
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	S1 > 20 m	S5 > 3 m			
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	DP Deep pools	CM Chum salmon	SA Salmon		NCD and wetlands are non-fish			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon		bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL22	Structure No.	117
Watershed Code:	910-665062-20282	Stream Order	6		
Stream Name	Wedeeene River	Stream Class	S1		
Crew	IM, NN	UTM_Zone	09	UTM Northing	6002085
Survey Date	6/21/2015			UTM Easting	521975
Time	15:16:00	Site Length (m)	100		
Channel	Visible Channel	Features	None		
Mean Channel Width (m)	39.67	Mean Wetted Width (m)	32.33	Mean Residual Pool Depth (m)	1.17
Mean Gradient (%)	2	Dominate Substrate	Cobbles	Sub-dominate Substrate	Boulders
In-stream Cover	Abundant	Dominant cover	B	Sub-dominant cover	DP, OV

Water Quality	Temperature (Deg C)	11.2	pH	No data	Conductivity (uS/cm)	18	Turbidity	L-Lightly turbid
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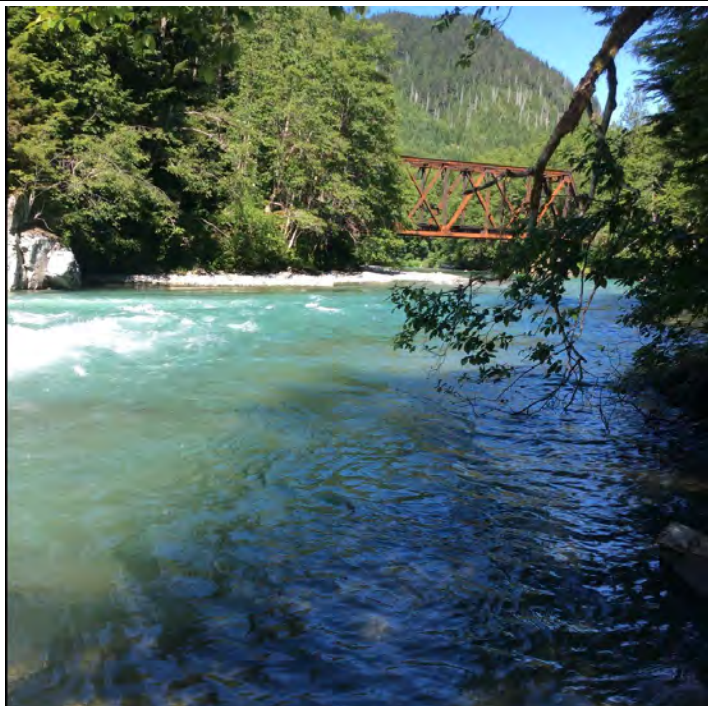
Riparian Vegetation		Crown Closure	21-40%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Cobbles	Right Bank Texture	Rock
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	Good - Select spawning areas along margins, in lower gradient riffles and glides.	
Rearing	Good - Good along the margins.	
Overwintering	Excellent - Excellent deep well oxygenated pools.	
Migration	Good - Good refuge areas along migration route.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments	Just upstream of proposed crossing and looking downstream towards rail bridge.
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Site Comments	Good to excellent quality habitat for all life stages of salmon and trout.
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Notes:	Cover	Fish Species	Stream Class
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback
			Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m
			Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.

# Terrace to Kitimat Transmission Project (TKTP)


## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL23	Structure No.	121			
Watershed Code:	910-665062-18290	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	IM, NN	UTM_Zone	09	UTM Northing	6000579			
Survey Date	6/21/2015			UTM Easting	521038			
Time	12:16:51	Site Length (m)	100					
Channel	Visible Channel	Features	TRB - Tributary					
Mean Channel Width (m)	1.89	Mean Wetted Width (m)	1.22	Mean Residual Pool Depth (m)	0.00			
Mean Gradient (%)	0	Dominate Substrate	Fines	Sub-dominate Substrate	Fines			
In-stream Cover	Abundant	Dominant cover	SWD	Sub-dominant cover	LWD, DP, IV, OV			
Water Quality	Temperature (Deg C)	15.4	pH	6.9	Conductivity (uS/cm)	24	Turbidity	C-Clear
Riparian Vegetation		Crown Closure	21-40%					
Left Bank Shape	Sloping	Right Bank Shape	Sloping					
Left Bank Texture	Fines	Right Bank Texture	Fines					
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood					
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest					
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Poor - Poor for all salmonids due to low flows, lack of gravels, and likely low dissolved oxygen. Abundant disconnected pools with algae.							
Rearing	Poor - Limited by low flows, likely low dissolved oxygen, stagnant disconnected pools with algae.							
Overwintering	Poor - Limited by low flows and disconnected pools.							
Migration	Poor - Limited by low flows and disconnected pools.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Yes	Species Captured-2015	NFC	Species Stage-2015	N/A			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Upstream extent of survey.							
Site Comments	No fish habitat. Abundant beaver dams with stagnant disconnected pools. Pools are filled with algae and are not flowing. Amphibian habitat, poor quality fish habitat. Likely low dissolved oxygen year round. No fish caught.							
								
Notes:	Cover	Fish Species	DV	Dolly varden	Stream Class	Non-fish bearing		
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey		Fish bearing			
	LWD Large woody debris	CC Sculpins	PK Pink salmon		S1 > 20 m	S5 > 3 m		
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey		S2 > 5 m - 20 m	S6 < 3 m		
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout		S3 1.5 m - 5 m	NVC No visible channel		
	DP Deep pools	CM Chum salmon	SA Salmon		S4 < 1.5 m	NCD Non-classified drainage		
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon			NCD and wetlands are non-fish bearing except where noted.		
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL24	Structure No.	123
Watershed Code:	910-665062-18290	Stream Order	3		
Stream Name	Unnamed	Stream Class	S2		
Crew	NN, IM, CW	UTM_Zone	09	UTM Northing	6000151
Survey Date	6/21/2015			UTM Easting	520695
Time	13:40:56	Site Length (m)	100		
Channel	Visible Channel	Features	None		
Mean Channel Width (m)	6.83	Mean Wetted Width (m)	4.87	Mean Residual Pool Depth (m)	0.41
Mean Gradient (%)	2	Dominate Substrate	Gravels	Sub-dominate Substrate	Cobbles
In-stream Cover	Abundant	Dominant cover	LWD	Sub-dominant cover	SWD, DP

Water Quality	Temperature (Deg C)	8.2	pH	8.1	Conductivity (uS/cm)	13	Turbidity	C-Clear
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Riparian Vegetation		Crown Closure	71-90%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Gravels
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	Excellent - Excellent spawning for trout, abundant pea-sized gravel.	
Rearing	Excellent - Diverse habitat types with good cover.	
Overwintering	Good - Abundant deep pools with adequate water flows.	
Migration	Excellent - No barriers, nice plunge pools below logs.	

Fish Information	Historical Fish Presence		SA, CCT, CO		
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments	
Typical channel with gravel substrates and functional large woody debris.	

Site Comments	Excellent creek for salmon and trout. Rearing and spawning excellent, embedded logs offer abundant pools and diversity.
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Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	Fish bearing	S5 > 3 m
	LWD Large woody debris	CC Sculpins	S1 > 20 m	S6 < 3 m
	B Boulder	CCT Coastal cutthroat trout	S2 > 5 m - 20 m	NVC No visible channel
	UC Undercut bank	CH Chinook salmon	S3 1.5 m - 5 m	NCD Non-classified drainage
	DP Deep pools	CM Chum salmon	S4 < 1.5 m	NCD and wetlands are non-fish bearing except where noted.
	OV Overhanging vegetation	CO Coho salmon		
	IV Instream vegetation	CCG Slimy sculpin		
		DV Dolly varden		
		L Lamprey		
		PK Pink salmon		
		PL Pacific Lamprey		
		RB Rainbow trout		
		SA Salmon		
		SK Sockeye salmon		
		TSB Threespine stickleback		

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



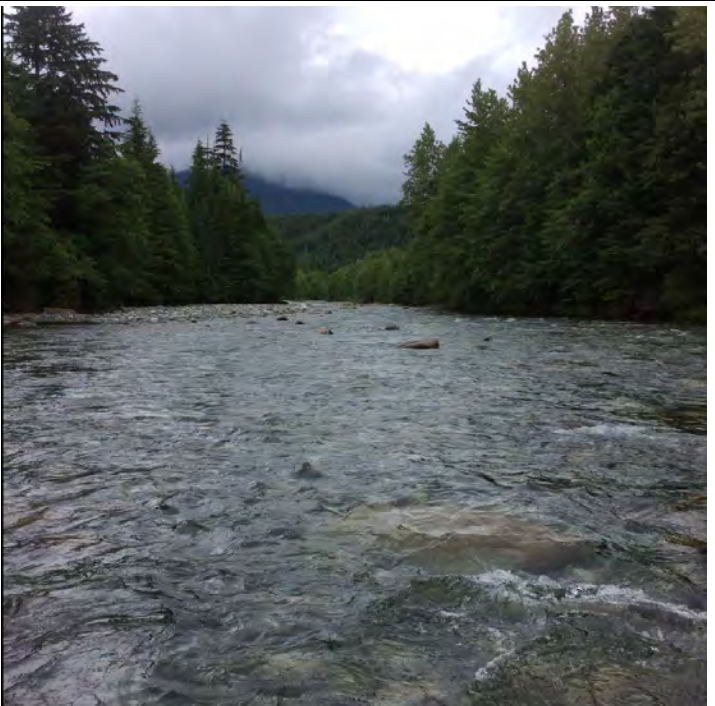
Crossing Type	Transmission Line	Site Number	TL25	Structure No.	129
Watershed Code:	910-665062-18290	Stream Order	5		
Stream Name	Little Wedeene River	Stream Class	S1		
Crew	IM, NN, LS	UTM_Zone	09	UTM Northing	5998783
Survey Date	6/20/2015			UTM Easting	519746
Time	09:53:09	Site Length (m)	200		
Channel	Visible Channel	Features	None		
Mean Channel Width (m)	42.83	Mean Wetted Width (m)	36.83	Mean Residual Pool Depth (m)	0.11
Mean Gradient (%)	1	Dominate Substrate	Boulders	Sub-dominate Substrate	Cobbles
In-stream Cover	Abundant	Dominant cover	B	Sub-dominant cover	LWD, DP

Water Quality	Temperature (Deg C)	8.5	pH	8.3	Conductivity (uS/cm)	25	Turbidity	C-Clear
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Riparian Vegetation		Crown Closure	1-20%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Cobbles	Right Bank Texture	Cobbles
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	Good - Good for large salmon such as chinook, moderate for smaller salmon and trout.	
Rearing	Excellent - Rearing habitat available along banks. Many fry observed.	
Overwintering	Good - Some deeper pools and margins may provide good overwintering habitat.	
Migration	Excellent - No barriers for adults or juveniles, good flow depth.	

Fish Information	Historical Fish Presence		PK, ST, CM, CH, CO		
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments	
Upstream extent of survey, looking upstream.	
Site Comments	<p>Good quality salmon river. No migration barriers, good overwintering potential in pools and margins. Larger substrates are good spawning for chinook. Patches of smaller gravel are moderate for smaller salmon or trout. Excellent rearing for juveniles. Abundant fry observed along banks in back eddies and under large woody debris. Good micro habitat variety, riffles, small pools, runs. River forks around island downstream of crossing site.</p>

Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.



# Terrace to Kitimat Transmission Project (TKTP)


## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL26	Structure No.	148			
Watershed Code:	910-665062-09749	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	IM, NN	UTM_Zone	09	UTM Northing	5994544			
Survey Date	6/19/2015			UTM Easting	519482			
Time	12:28:07	Site Length (m)	100					
Channel	Visible Channel	Features	None					
Mean Channel Width (m)	1.74	Mean Wetted Width (m)	0.98	Mean Residual Pool Depth (m)	0.14			
Mean Gradient (%)	17	Dominate Substrate	Gravels	Sub-dominate Substrate	Cobbles			
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	LWD, SWD			
Water Quality	Temperature (Deg C)	9.4	pH	8.1	Conductivity (uS/cm)	222	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	21-40%				
Left Bank Shape	Sloping		Right Bank Shape	Sloping				
Left Bank Texture	Gravels		Right Bank Texture	Gravels				
Left Bank Riparian Vegetation	Coniferous		Right Bank Riparian Vegetation	Coniferous				
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - Very few riffle-pool areas with gravel for spawning.							
Rearing	Moderate - Trout rearing habitat, likely no salmon access due to small size and low flows. Good cover and some deep pools for rearing.							
Overwintering	Poor - Trout minimal overwintering in deep pools.							
Migration	Poor - Trout migration only, no depth for salmon.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Yes	Species Captured-2015	RB	Species Stage-2015	Parr			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Downstream extent of the survey.							
Site Comments	Moderate quality habitat for young trout. Some pools offer good cover with undercuts woody debris and overhanging vegetation. Some steps down to pools, poor migration potential at time of survey.							
								
Notes:	Cover	Fish Species	DV	Stream Class	Fish bearing	Non-fish bearing		
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	S1 > 20 m	S5 > 3 m			
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	DP Deep pools	CM Chum salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL27	Structure No.	149			
Watershed Code:	910-665062-09749	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	IM, NN	UTM_Zone	09	UTM Northing	5994139			
Survey Date	6/19/2015			UTM Easting	519523			
Time	10:42:09	Site Length (m)	100					
Channel	Visible Channel	Features	None					
Mean Channel Width (m)	1.67	Mean Wetted Width (m)	1.24	Mean Residual Pool Depth (m)	0.15			
Mean Gradient (%)	13	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels			
In-stream Cover	Abundant	Dominant cover	SWD, OV	Sub-dominant cover	LWD			
Water Quality	Temperature (Deg C)	9.5	pH	8.0	Conductivity (uS/cm)	175	Turbidity	C-Clear
Riparian Vegetation		Crown Closure	41-70%					
Left Bank Shape	Sloping	Right Bank Shape	Sloping					
Left Bank Texture	Fines	Right Bank Texture	Fines					
Left Bank Riparian Vegetation	Coniferous	Right Bank Riparian Vegetation	Coniferous					
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest					
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No appropriate gravels for salmonids.							
Rearing	Poor - Poor quality habitat provided by intermittent channel at time of survey.							
Overwintering	None - No sufficiently deep pools, low flows and therefore low dissolved oxygen.							
Migration	None - No continuous flows may prevent upstream migration for larger adults.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Yes	Species Captured-2015	RB	Species Stage-2015	Parr			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Pool habitat looking downstream.							
Site Comments	Some subsurface intermittent flows and channel. High cover available. Some isolated pools - these are the only areas that provide habitat at time of survey. Majority of creek too shallow for rearing.							
Notes:	Cover	Fish Species	DV	Stream Class	Fish bearing	Non-fish bearing		
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	S1 > 20 m	S5 > 3 m			
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	DP Deep pools	CM Chum salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL28	Structure No.	151
Watershed Code:	910-665062-09749	Stream Order	1		
Stream Name	Unnamed	Stream Class	S5		
Crew	IM, NN	UTM_Zone	09	UTM Northing	5993986
Survey Date	6/19/2015			UTM Easting	519571
Time	14:30:35	Site Length (m)	100		
Channel	Visible Channel	Features	None		
Mean Channel Width (m)	3.46	Mean Wetted Width (m)	2.94	Mean Residual Pool Depth (m)	1.35
Mean Gradient (%)	5	Dominate Substrate	Cobbles	Sub-dominate Substrate	Gravels
In-stream Cover	Abundant	Dominant cover	SWD	Sub-dominant cover	LWD, OV

Water Quality	Temperature (Deg C)	10.0	pH	8.1	Conductivity (uS/cm)	81	Turbidity	C-Clear
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Riparian Vegetation		Crown Closure	71-90%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Gravels	Right Bank Texture	Gravels
Left Bank Riparian Vegetation	Coniferous	Right Bank Riparian Vegetation	Coniferous
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	None - No spawning, no fish access to site.	
Rearing	None - No potential for fish access to site.	
Overwintering	None - No potential for fish access to site.	
Migration	None - No potential for fish access to site.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Yes	Species Captured-2015	NFC	Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	NFC	Species Stage-2016	N/A

Photo Comments	
Downstream extent of survey, upstream of old road.	

Site Comments	
Low flows and small pools. Barrier found to fish passage downstream of site. Series of steep cascades and falls. Section is approximately 16 m long with large elevation drop, estimated to be 10 m. No fish passage possible up cascades. Juvenile coastal cutthroat trout captured downstream of cascades.	



Notes:	Cover	Fish Species	Stream Class	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	Fish bearing	Non-fish bearing
	LWD Large woody debris	CC Sculpins	S1 > 20 m	S5 > 3 m
	B Boulder	CCT Coastal cutthroat trout	S2 > 5 m - 20 m	S6 < 3 m
	UC Undercut bank	CH Chinook salmon	S3 1.5 m - 5 m	NVC No visible channel
	DP Deep pools	CM Chum salmon	S4 < 1.5 m	NCD Non-classified drainage
	OV Overhanging vegetation	CO Coho salmon		NCD and wetlands are non-fish bearing except where noted.
	IV Instream vegetation	CCG Slimy sculpin		
		DV Dolly varden		
		L Lamprey		
		PK Pink salmon		
		PL Pacific Lamprey		
		RB Rainbow trout		
		SA Salmon		
		SK Sockeye salmon		
		TSB Threespine stickleback		

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL29	Structure No.	156			
Watershed Code:	910-665062-09749	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	IM, NN	UTM_Zone	09	UTM Northing	5992999			
Survey Date	6/19/2015			UTM Easting	519559			
Time	16:53:53	Site Length (m)	100					
Channel	Visible Channel	Features	None					
Mean Channel Width (m)	1.68	Mean Wetted Width (m)	1.21	Mean Residual Pool Depth (m)	0.15			
Mean Gradient (%)	16	Dominate Substrate	Cobbles	Sub-dominate Substrate	Gravels			
In-stream Cover	Moderate	Dominant cover	B	Sub-dominant cover	LWD, SWD, OV, UC			
Water Quality	Temperature (Deg C)	10.5	pH	7.9	Conductivity (uS/cm)	117	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	41-70%				
Left Bank Shape	Sloping		Right Bank Shape	Sloping				
Left Bank Texture	Gravels		Right Bank Texture	Gravels				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No adequate gravel.							
Rearing	Moderate - Pool rearing habitat for juvenile trout is available but does not have much depth or area. Good variety of other cover types available.							
Overwintering	Poor - Possible overwintering for juvenile trout in shallow pools. Low flows and ice may prevent overwintering in most areas.							
Migration	Poor - Poor migration for trout, none for salmon, step pools present with low flow depth.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Yes	Species Captured-2015	RB	Species Stage-2015	Parr			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Looking upstream from the crossing site.							
Site Comments	Moderate rearing for small juvenile trout. Pools support trout with good cover. Large bodied fish habitat is absent. Step pool morphology throughout with low flows.							
Notes:	Cover	Fish Species	Stream Class	Non-fish bearing				
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL3	Structure No.	7			
Watershed Code:	400-174068-34330	Stream Order	2					
Stream Name	Unnamed	Stream Class	S2					
Crew	BH, IM	UTM_Zone	09	UTM Northing	6032035			
Survey Date	6/28/2015			UTM Easting	523553			
Time	08:59:01	Site Length (m)	100					
Channel	Visible Channel	Features	None					
Mean Channel Width (m)	5.45	Mean Wetted Width (m)	3.66	Mean Residual Pool Depth (m)	0.38			
Mean Gradient (%)	2	Dominate Substrate	Gravels	Sub-dominate Substrate	Fines			
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	LWD, SWD, UC			
Water Quality	Temperature (Deg C)	14.7	pH	7.8	Conductivity (uS/cm)	89	Turbidity	C-Clear
Riparian Vegetation		Crown Closure	41-70%					
Left Bank Shape	Undercut	Right Bank Shape	Undercut					
Left Bank Texture	Fines	Right Bank Texture	Fines					
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood					
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest					
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Excellent - Good gravel variety, riffles and pools with gravel throughout.							
Rearing	Good - Only limited by low flow. All fish found in shallow pools.							
Overwintering	Poor - Limited by low flow and limited pool depths.							
Migration	Poor - Too low flow for adults. Low flow depth at pool tail outs limits juveniles.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Yes	Species Captured-2015	CO, DV, BL, CCT	Species Stage-2015	Fry, Parr, Juvenile,			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Looking upstream at the top of site.							
Site Comments	Good fish species diversity for such a small stream with low summer flow. Habitat is very diverse with lots of cover but is flow limited in summer.							
Notes:	Cover	Fish Species	DV	Stream Class	Fish bearing	Non-fish bearing		
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	S1 > 20 m	S5 > 3 m			
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	DP Deep pools	CM Chum salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL30	Structure No.	157			
Watershed Code:	910-665062-09749	Stream Order	N/A					
Stream Name	Unnamed	Stream Class	NVC					
Crew	IM, NN, CW	UTM_Zone	09	UTM Northing	5992733			
Survey Date	6/18/2015			UTM Easting	519438			
Time	12:42:39	Site Length (m)	100					
Channel	No Visible Channel	Features	None					
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A			
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A			
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A			
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation			Crown Closure	N/A				
Left Bank Shape			N/A	Right Bank Shape	N/A			
Left Bank Texture			N/A	Right Bank Texture	N/A			
Left Bank Riparian Vegetation			N/A	Right Bank Riparian Vegetation	N/A			
Left Bank Stage			N/A	Right Bank Stage	N/A			
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments								
Upstream of site. Upstream of existing road (RD165)								
Site Comments								
No visible channel upstream of road. Small pool upstream of road, no flowing water. Mud and vegetation including skunk cabbage.								
Notes:	Cover	Fish Species	Stream Class					
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon	NCD and wetlands are non-fish bearing except where noted.				
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16




Crossing Type	Transmission Line	Site Number	TL31	Structure No.	158
Watershed Code:	910-665062-09000	Stream Order	2		
Stream Name	Unnamed	Stream Class	S2		
Crew	IM, NN, CW	UTM_Zone	09	UTM Northing	5992542
Survey Date	6/18/2015			UTM Easting	519193
Time	11:07:32	Site Length (m)	100		
Channel	Visible Channel	Features	None		
Mean Channel Width (m)	8.67	Mean Wetted Width (m)	5.43	Mean Residual Pool Depth (m)	0.37
Mean Gradient (%)	10	Dominate Substrate	Cobbles	Sub-dominate Substrate	Boulders
In-stream Cover	Moderate	Dominant cover	B	Sub-dominant cover	DP, OV

Water Quality	Temperature (Deg C)	9.1	pH	7.9	Conductivity (uS/cm)	64	Turbidity	C-Clear
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Riparian Vegetation		Crown Closure	41-70%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Boulder/Block	Right Bank Texture	Boulder/Block
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	Poor - Patches of gravel for trout, no access for salmon.	
Rearing	Good - Good cover, good habitat variety, cascade upstream, large falls downstream.	
Overwintering	Poor - Few deep pools.	
Migration	Poor - Cascade likely passable only at high flows.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Yes	Species Captured-2015	RB	Species Stage-2015	Fry, Parr
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments	
Downstream extent of the survey.	

Site Comments
Large series of falls downstream of site, 3 falls, 4 to 6 m tall. No access for fish up falls. Braided channel at crossing site. Good rearing trout habitat. RB captured, likely resident population upstream of falls barriers. Cascade at upstream end of site acts as partial barrier for small fish. Adults may pass during high flows.



Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL32	Structure No.	160			
Watershed Code:	910-665062-09000	Stream Order	1					
Stream Name	Unnamed	Stream Class	S6					
Crew	NN, IM	UTM_Zone	09	UTM Northing	5992185			
Survey Date	5/11/2016			UTM Easting	519032			
Time	16:44:09	Site Length (m)	100					
Channel	Visible channel	Features	C - Cascade or chute					
Mean Channel Width (m)	2.03	Mean Wetted Width (m)	1.54	Mean Residual Pool Depth (m)	0.13			
Mean Gradient (%)	32	Dominate Substrate	Cobbles	Sub-dominate Substrate	Boulders			
In-stream Cover	Moderate	Dominant cover	B	Sub-dominant cover	LWD, SWD, DP			
Water Quality	Temperature (Deg C)	8.8	pH	8.3	Conductivity (uS/cm)	123	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	21-40%				
Left Bank Shape	Undercut		Right Bank Shape	Sloping				
Left Bank Texture	Cobbles		Right Bank Texture	Cobbles				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No migration to site is possible because of steep gradient. No spawning habitat is available.							
Rearing	None - Gradient is too steep to support rearing fishes.							
Overwintering	None - No access due to gradient barrier and falls.							
Migration	None - Too steep to allow fish access.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Yes	Species Captured-2016	NFC	Species Stage-2016	N/A			
Photo Comments	Steep gradient at crossing. Small waterfall chutes.							
Site Comments	Channel too steep to support fish habitat at crossing location. Crossing site was electrofished in 2016, no fish were captured. Stream was electrofished approximately 300 m downstream and captured juvenile rainbow trout.							
Notes:			Cover			Fish Species		
N/A Assessed but no data to report			SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation			AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin		
			DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback			Stream Class <u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m		
						<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.		





# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL33	Structure No.	140
Watershed Code:	910-665062-09000	Stream Order	1		
Stream Name	Unnamed	Stream Class	S5		
Crew	IM, NN	UTM_Zone	09	UTM Northing	5991688
Survey Date	5/11/2016			UTM Easting	519070
Time	14:06:09	Site Length (m)	100		
Channel	Visible channel	Features	None		
Mean Channel Width (m)	5.58	Mean Wetted Width (m)	3.88	Mean Residual Pool Depth (m)	0.45
Mean Gradient (%)	29	Dominate Substrate	Boulders	Sub-dominate Substrate	Rock
In-stream Cover	Moderate	Dominant cover	B	Sub-dominant cover	DP

Water Quality	Temperature (Deg C)	8.2	pH	8.4	Conductivity (uS/cm)	15	Turbidity	C-Clear
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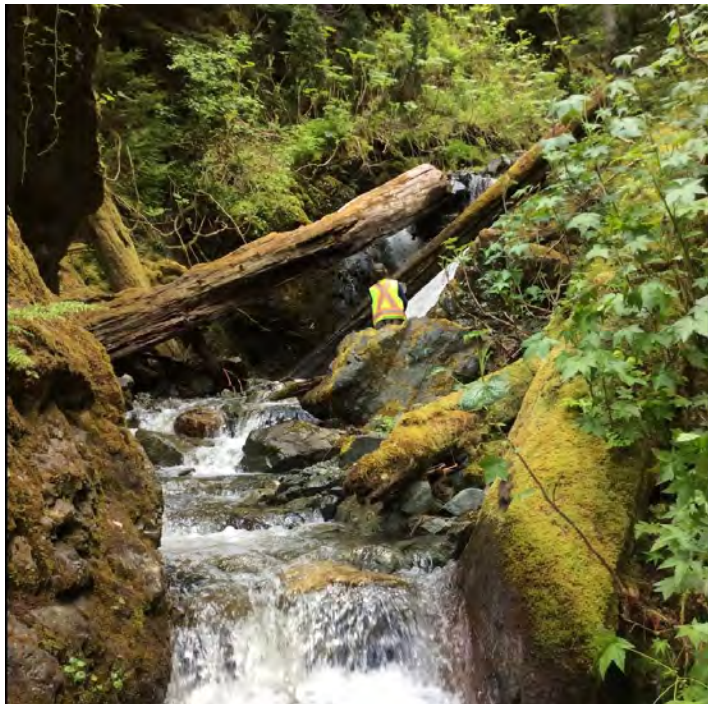
Riparian Vegetation		Crown Closure	1-20%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Rock	Right Bank Texture	Rock
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	None - Fish access to site not possible.	
Rearing	None - No potential for fish access to site.	
Overwintering	None - No potential for fish access to site.	
Migration	None - Migration blocked by barrier and high velocities immediately downstream of site.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A

**Photo Comments**  
Barrier cascades at upper end of survey.

**Site Comments**  
Barrier site downstream of TL33. Cascade pools downstream for ~200 m, with increasing gradient towards barrier: 100 m at 20%, 100 m at 25%. Immediately downstream of barrier, gradient is 30%. Barrier consists of a series of cascades and shallow pools. First downstream cascades is 2 m high, with 0.5 m plunge pool, 2nd cascade is 1.5 m with 0.75 m pool, third cascade is 6 m with 0.80 m pool. Downstream of barrier, habitat for fish is limited by high gradients and high velocity water flows. Excellent spawning and rearing habitat for salmonids present further down stream, closer to valley bottom.



<b>Notes:</b> N/A Assessed but no data to report	<b>Cover</b> SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	<b>Fish Species</b> AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<b>Stream Class</b> <u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.
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# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL35	Structure No.	166			
Watershed Code:	910-665062-09000	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	IM, NN	UTM_Zone	09	UTM Northing	5990813			
Survey Date	5/10/2016			UTM Easting	518874			
Time	14:28:44	Site Length (m)	100					
Channel	Visible channel	Features	None					
Mean Channel Width (m)	2.15	Mean Wetted Width (m)	1.42	Mean Residual Pool Depth (m)	0.10			
Mean Gradient (%)	13	Dominate Substrate	Boulders	Sub-dominate Substrate	Cobbles			
In-stream Cover	Abundant	Dominant cover	B	Sub-dominant cover	LWD, SWD, IV, OV			
Water Quality	Temperature (Deg C)	4.9	pH	6.4	Conductivity (uS/cm)	17	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	41-70%				
Left Bank Shape	Sloping		Right Bank Shape	Sloping				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Coniferous		Right Bank Riparian Vegetation	Coniferous				
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No spawning gravel bars, large substrates only. Likely no access for spawners.							
Rearing	Poor - If juveniles can access reach, poor rearing habitat present during, possibly better in higher water periods. Abundant diverse cover, but limited depth and no deep pool habitat. Cascades also present to limit upstream travel by juveniles.							
Overwintering	None - None, no deep pools, likely freezes to bottom.							
Migration	None - Adult access limited by flow depth. During freshet, higher depths may be present but steep gradient may cause fast, impassable flows.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Yes	Species Captured-2016	NFC	Species Stage-2016	N/A			
Photo Comments	Steep section downstream of surveyed reach (37% gradient).							
Site Comments	Narrow small stream in steep rocky gully. Boulders, cobbles, present throughout, possibly indicating high flows that would remove fine particles. Upper reach is flatter and slower moving, gradient increases towards downstream end of reach. Fish access is dependent on fish access to lake outlet upstream. Habitat generally moderate to poor for small juvenile salmonids. Large fish would have trouble accessing site due to limited water depth. Downstream of site there is a short section of channel with a gradient of 37%. This steep section may be a barrier to fish passage. Downstream fish access should be re-evaluated at a different time of year to confirm fish-bearing status.							
Notes:	Cover	Fish Species	DV	Dolly varden	Stream Class			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey		Fish bearing			Non-fish bearing
	LWD Large woody debris	CC Sculpins	PK Pink salmon		S1 > 20 m			S5 > 3 m
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey		S2 > 5 m - 20 m			S6 < 3 m
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout		S3 1.5 m - 5 m			NVC No visible channel
	DP Deep pools	CM Chum salmon	SA Salmon		S4 < 1.5 m			NCD Non-classified drainage
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					NCD and wetlands are non-fish bearing except where noted.
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL37	Structure No.	174			
Watershed Code:	910-665062-04593	Stream Order	N/A					
Stream Name	Unnamed	Stream Class	NVC					
Crew	IM, NN, CW	UTM_Zone	09	UTM Northing	5988598			
Survey Date	6/17/2015			UTM Easting	518746			
Time	14:52:09	Site Length (m)	100					
Channel	No Visible Channel	Features	None					
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A			
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A			
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A			
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation			Crown Closure	N/A				
Left Bank Shape			N/A	Right Bank Shape	N/A			
Left Bank Texture			N/A	Right Bank Texture	N/A			
Left Bank Riparian Vegetation			N/A	Right Bank Riparian Vegetation	N/A			
Left Bank Stage			N/A	Right Bank Stage	N/A			
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments								
NVC downstream of crossing site.								
Site Comments			No visible channel downstream of crossing site. No water, no flow, and no fish habitat.					
Notes:			N/A Assessed but no data to report					
Cover			Fish Species			Stream Class		
SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation			AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin			DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback		
						Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m		
						Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.		

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL38	Structure No.	173			
Watershed Code:	910-665062-04593	Stream Order	N/A					
Stream Name	Unnamed	Stream Class	NVC					
Crew	IM, NN, CW	UTM_Zone	09	UTM Northing	5988792			
Survey Date	6/17/2015			UTM Easting	518552			
Time	14:52:09	Site Length (m)	100					
Channel	No Visible Channel	Features	None					
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A			
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A			
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A			
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation			Crown Closure	N/A				
Left Bank Shape			N/A	Right Bank Shape	N/A			
Left Bank Texture			N/A	Right Bank Texture	N/A			
Left Bank Riparian Vegetation			N/A	Right Bank Riparian Vegetation	N/A			
Left Bank Stage			N/A	Right Bank Stage	N/A			
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments								
NVC downstream of crossing site.								
Site Comments			No visible channel downstream of crossing site. No water, no flow and no fish habitat.					
Notes:			<div> <div> <b>Cover</b>  N/A Assessed but no data to report </div> <div> <b>Fish Species</b>  AS Atlantic salmon  CC Sculpins  CCT Coastal cutthroat trout  CH Chinook salmon  CM Chum salmon  CO Coho salmon  CCG Slimy sculpin </div> <div> <b>Stream Class</b>  <b>Fish bearing</b>  S1 &gt; 20 m  S2 &gt; 5 m - 20 m  S3 1.5 m - 5 m  S4 &lt; 1.5 m </div> <div> <b>Non-fish bearing</b>  S5 &gt; 3 m  S6 &lt; 3 m  NVC No visible channel  NCD Non-classified drainage  NCD and wetlands are non-fish bearing except where noted. </div> </div>					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL39	Structure No.	175
Watershed Code:	910-665062-04593	Stream Order	1		
Stream Name	Unnamed	Stream Class	S5		
Crew	NN, IM, CW	UTM_Zone	09	UTM Northing	5988403
Survey Date	6/18/2015			UTM Easting	518700
Time	16:46:59	Site Length (m)	100		
Channel	Dry Channel	Features	C - Cascade		
Mean Channel Width (m)	7.00	Mean Wetted Width (m)	-	Mean Residual Pool Depth (m)	-
Mean Gradient (%)	30	Dominate Substrate	Boulders	Sub-dominate Substrate	Rock
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	LWD, SWD

Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
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<b>Riparian Vegetation</b>		Crown Closure	41-70%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

<b>Habitat Comments</b>	Fish Species	AO - All Salmonids
Spawning	None - No passage for fish, no potential migration or access.	
Rearing	None - No passage for fish, no potential migration or access	
Overwintering	None - No passage for fish, no potential migration or access	
Migration	None - No passage for fish, no potential migration or access	

Fish Information	Historical Fish Presence		No data		
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A

<b>Photo Comments</b>	
Dry channel.	

<b>Site Comments</b>	
Dry channel. Stream is highly disturbed by flashy water flows. Large substrate and debris piles are present throughout. Large trees and boulders are piled throughout the channel. No passage for fish during dry periods. Flows during floods are likely too high to allow fish passage. Gradient below crossing site is high, approx 30%. Groundwater flows are likely present below large debris bed. Groundwater flows become surface flows at one 10 m long section. Channel is approx 7 m wide, deeply entrenched. Banks are steep, eroded by high flows.	



<b>Notes:</b>	<b>Cover</b>	<b>Fish Species</b>	<b>Stream Class</b>
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	<u>Fish bearing</u>
	LWD Large woody debris	CC Sculpins	S1 > 20 m
	B Boulder	CCT Coastal cutthroat trout	S2 > 5 m - 20 m
	UC Undercut bank	CH Chinook salmon	S3 1.5 m - 5 m
	DP Deep pools	CM Chum salmon	S4 < 1.5 m
	OV Overhanging vegetation	CO Coho salmon	
	IV Instream vegetation	CCG Slimy sculpin	
		DV Dolly varden	<u>Non-fish bearing</u>
		L Lamprey	S5 > 3 m
		PK Pink salmon	S6 < 3 m
		PL Pacific Lamprey	NVC No visible channel
		RB Rainbow trout	NCD Non-classified drainage
		SA Salmon	NCD and wetlands are non-fish bearing except where noted.
		SK Sockeye salmon	
		TSB Threespine stickleback	

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL4 /8A	Structure No.	14			
Watershed Code:	400-174068-34330	Stream Order	1					
Stream Name	Unnamed	Stream Class	S4					
Crew	LM, NN	UTM_Zone	09	UTM Northing	6031790			
Survey Date	6/15/2015			UTM Easting	523570			
Time	15:20:20	Site Length (m)	100					
Channel	Dry Channel	Features	None					
Mean Channel Width (m)	1.41	Mean Wetted Width (m)	0.00	Mean Residual Pool Depth (m)	0.00			
Mean Gradient (%)	1	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels			
In-stream Cover	Moderate	Dominant cover	SWD	Sub-dominant cover	OV, UC			
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
Riparian Vegetation			Crown Closure	71-90%				
Left Bank Shape	Undercut		Right Bank Shape	Undercut				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No appropriate gravels.							
Rearing	Poor - When water is present in the spring it may be used by juveniles in the lower reaches.							
Overwintering	None - No deep pools observed.							
Migration	Poor - Migration only possible when water present during seasonal flooding.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Yes	Species Captured-2016	NFC	Species Stage-2016	N/A			
Photo Comments	View of dry channel looking downstream.							
Site Comments	Dry channel. Seasonally flowing stream likely provides only occasional rearing and holding habitat for fish in lower reaches during wet periods. Evidence of significant water flow and scour was observed, but no water was found in the channel.							
Notes:	Cover	Fish Species	DV	Dolly varden	Stream Class	Fish bearing	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey		S1 > 20 m	S5 > 3 m		
	LWD Large woody debris	CC Sculpins	PK Pink salmon		S2 > 5 m - 20 m	S6 < 3 m		
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey		S3 1.5 m - 5 m	NVC No visible channel		
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout		S4 < 1.5 m	NCD Non-classified drainage		
	DP Deep pools	CM Chum salmon	SA Salmon			NCD and wetlands are non-fish bearing except where noted.		
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL40	Structure No.	181			
Watershed Code:	910-665062-04593	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	NN, IM, CW	UTM_Zone	09	UTM Northing	5987242			
Survey Date	6/17/2015			UTM Easting	518699			
Time	12:33:15	Site Length (m)	100					
Channel	Visible Channel	Features	RO - Rock outcrop					
Mean Channel Width (m)	2.26	Mean Wetted Width (m)	1.00	Mean Residual Pool Depth (m)	0.10			
Mean Gradient (%)	12	Dominate Substrate	Gravels	Sub-dominate Substrate	Cobbles			
In-stream Cover	Abundant	Dominant cover	SWD	Sub-dominant cover	LWD, OV			
Water Quality	Temperature (Deg C)	11.1	pH	8.4	Conductivity (uS/cm)	103	Turbidity	C-Clear
Riparian Vegetation		Crown Closure	>90%					
Left Bank Shape	Sloping	Right Bank Shape	Sloping					
Left Bank Texture	Rock	Right Bank Texture	Boulder/Block					
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood					
Left Bank Stage	Pole/Sapling	Right Bank Stage	Pole/Sapling					
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No appropriate gravels.							
Rearing	Poor - Some rearing habitat, good cover, limited by flow depths.							
Overwintering	None - No sufficiently deep pools, low flows and therefore low dissolved oxygen.							
Migration	Poor - Gradient ranges from 9-19%, low flow depths, accessible only to small-bodied fish.							
Fish Information	Historical Fish Presence	CO						
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Downstream view.							
Site Comments	<p>Small, defined stream channel with some poor-quality rearing and migrating habitat. Low water depths limit access for fish and habitat area in the channel. Abundant woody debris and overhanging vegetation enclose the stream, offering high levels of cover. Small gravel for spawning and deep pools for overwintering are absent.</p>							
Notes:	Cover	Fish Species	Stream Class					
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m				Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL41	Structure No.	181
Watershed Code:	910-665607	Stream Order	5		
Stream Name	Anderson Creek	Stream Class	S2		
Crew	IM	UTM_Zone	09	UTM Northing	5985700
Survey Date	6/17/2015			UTM Easting	518780
Time	10:34:05	Site Length (m)	100		
Channel	Visible Channel	Features	EOF - Fishway, RO - Rock Outcrop		
Mean Channel Width (m)	18.42	Mean Wetted Width (m)	14.34	Mean Residual Pool Depth (m)	0.46
Mean Gradient (%)	1	Dominate Substrate	Cobbles	Sub-dominate Substrate	Gravels
In-stream Cover	Moderate	Dominant cover	B	Sub-dominant cover	DP

Water Quality	Temperature (Deg C)	9.9	pH	8.6	Conductivity (uS/cm)	34	Turbidity	C-Clear
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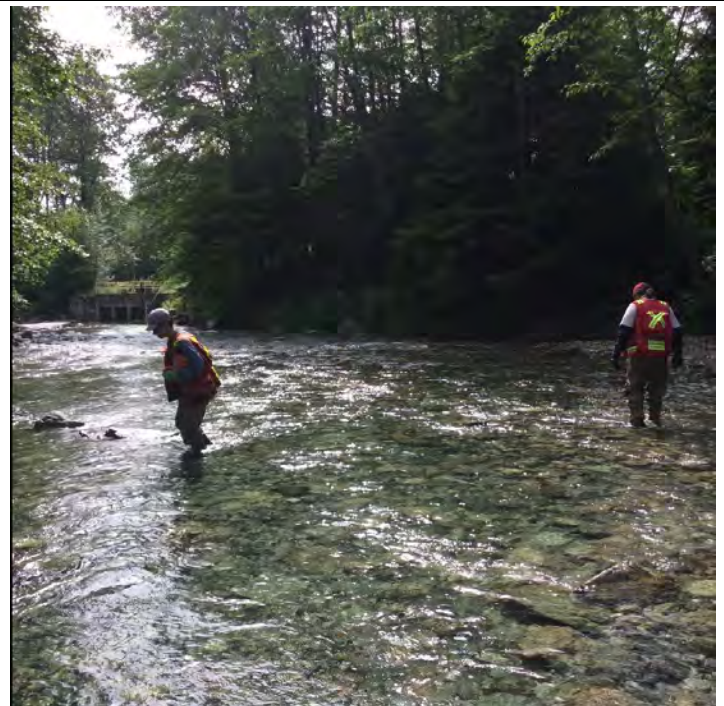
Riparian Vegetation		Crown Closure	21-40%
Left Bank Shape	Vertical	Right Bank Shape	Sloping
Left Bank Texture	Anthropogenic	Right Bank Texture	Cobbles
Left Bank Riparian Vegetation	Deciduous	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	Good - Gravel variety, riffles and pools with gravel throughout.	
Rearing	Good - Moderate cover, habitat variety.	
Overwintering	Good - Deep pools throughout, good flows.	
Migration	Moderate - Falls barrier upstream of site, fish ladder approximately 200 m downstream of site. Likely passable only by large salmon.	

Fish Information	Historical Fish Presence		CO, CC, CH, PL, SK, PK, CLA, CCG		
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A


Photo Comments	Downstream extent of Anderson Creek site.
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Site Comments	Good quality habitat for salmonids. Variety of habitats, including pools, riffles, back eddies. Gravel suitable for spawning throughout reach. Impassable falls upstream of site. Fish ladder located 150 m downstream of crossing site. Armored bank on left bank, some pieces of concrete slab throughout channel. Power line crosses above creek.
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Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.



Terrace to Kitimat Transmission Project (TKTP) Freshwater Fish and Fish Habitat Catalog						Prepared for BC Hydro			
						Project No	VE52379		
						Date	28-Oct-16		

Crossing Type	Transmission Line	Site Number	TL42	Structure No.	140			
Watershed Code:	910-665062-20282		Stream Order	1				
Stream Name	Unnamed		Stream Class	S6				
Crew	IM, HC, WM		UTM_Zone	09	UTM Northing 5995839			
Survey Date	7/5/2016			UTM Easting	520098			
Time	14:37:56		Site Length (m)	100				
Channel	Visible channel		Features	None				
Mean Channel Width (m)	2.59	Mean Wetted Width (m)	2.11	Mean Residual Pool Depth (m)	0.15			
Mean Gradient (%)	15	Dominate Substrate	Gravels	Sub-dominate Substrate	Cobbles			
In-stream Cover	Abundant	Dominant cover	LWD	Sub-dominant cover	SWD, OV			
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	41-70%				
Left Bank Shape	Sloping		Right Bank Shape	Sloping				
Left Bank Texture	Gravels		Right Bank Texture	Gravels				
Left Bank Riparian Vegetation	Coniferous		Right Bank Riparian Vegetation	Coniferous				
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No spawning, no fish access to site.							
Rearing	None - No potential for fish access to site.							
Overwintering	None - No potential for fish access to site.							
Migration	None - No potential for fish access to site.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Yes	Species Captured-2016	NFC		Species Stage-2016	N/A		
Photo Comments								
Upstream extent of survey.								
Site Comments			<p>Stream is very nice, well defined channel. However, barrier to fish passage was identified downstream. Fishing done at crossing sites and immediately upstream of barrier, no fish captured. Fishing for 55 seconds below barrier captured 2 coastal cutthroat trout parr. No fish access above barrier site. Crossing sites upstream are non-fish bearing.</p>					
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing	S5 > 3 m			
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S6 < 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	NVC No visible channel			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NCD Non-classified drainage			
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD and wetlands are non-fish bearing except where noted.			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL45/ 47A.1	Structure No.	47			
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	DF, NN	UTM_Zone	09	UTM Northing	6021358			
Survey Date	6/30/2016			UTM Easting	523162			
Time	13:07:39	Site Length (m)	100					
Channel	Dry Channel	Features	None					
Mean Channel Width (m)	1.81	Mean Wetted Width (m)	0.29	Mean Residual Pool Depth (m)	0.08			
Mean Gradient (%)	1	Dominate Substrate	Fines	Sub-dominate Substrate	Fines			
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	LWD, SWD, DP			
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
Riparian Vegetation			Crown Closure	41-70%				
Left Bank Shape	Sloping		Right Bank Shape	Sloping				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No gravels or coarse substrate. Bed material is comprised of fine and organic materials.							
Rearing	Poor - Dry channel with some small isolated pools. May provide some rearing opportunities during higher flows.							
Overwintering	None - Fish likely overwinter in beaver impoundment where the tributary enters another creek.							
Migration	Poor - Dry channel prevents fish movements. Watercourse flows into a beaver impoundment. If beaver impoundment is fish bearing then there are no other barriers. If impoundment is not fish bearing, the beaver dam may create a fish barrier.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Downstream extent of the reach showing dry channel.							
Site Comments	Watercourse converges with another tributary at a beaver impoundment. The first ten meters are wetted however the majority of the watercourse is dry. Some small isolated pools exist further upstream. The channel extends approximately 70 m upstream of the crossing site before becoming non-classified drainage. No coarse substrate found within the study area. Bed substrate comprised of organic and fine materials.							
Notes:			Cover			Fish Species		
N/A Assessed but no data to report			SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation			AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin		
			DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback			Stream Class <u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m		
						<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.		





# Terrace to Kitimat Transmission Project (TKTP)


## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL5 /9A	Structure No.	9			
Watershed Code:	400-174068-34330	Stream Order	1					
Stream Name	Unnamed	Stream Class	S4					
Crew	IM, NN	UTM_Zone	09	UTM Northing	6031641			
Survey Date	6/16/2015			UTM Easting	523592			
Time	13:23:20	Site Length (m)	100					
Channel	Dry Channel	Features	None					
Mean Channel Width (m)	1.49	Mean Wetted Width (m)	0.26	Mean Residual Pool Depth (m)	0.06			
Mean Gradient (%)	3	Dominate Substrate	Gravels	Sub-dominate Substrate	Fines			
In-stream Cover	Moderate	Dominant cover	SWD	Sub-dominant cover	LWD, OV			
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
Riparian Vegetation			Crown Closure	71-90%				
Left Bank Shape	Sloping		Right Bank Shape	Sloping				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Poor - No water during summer, lack of appropriate gravels.							
Rearing	Moderate - Potential seasonal rearing for salmon and minnows. Good cover, but low flow during summer. Intermittent, disconnected pools only habitat available in June.							
Overwintering	None - No deep pools observed.							
Migration	Poor - Seasonal creek, likely only holds water during storms or during spring melt.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Yes	Species Captured-2016	NFC	Species Stage-2016	N/A			
Photo Comments	Dry channel facing downstream looking towards crossing.							
Site Comments	Mostly dry channel, small, shallow residual pools present approx every 10 m. Low flow during summer, only seasonal use during high flow periods.							
								
Notes:	Cover	Fish Species	Stream Class					
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	Fish bearing				Non-fish bearing
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL53	Structure No.	101			
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	S5					
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6005920			
Survey Date	6/30/2016			UTM Easting	521104			
Time	12:28:37	Site Length (m)	300					
Channel	Other	Features	None					
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)	No data			
Mean Gradient (%)	30	Dominate Substrate	No data	Sub-dominate Substrate	No data			
In-stream Cover	No data	Dominant cover	No data	Sub-dominant cover	No data			
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	No data				
Left Bank Shape			No data	Right Bank Shape	No data			
Left Bank Texture			No data	Right Bank Texture	No data			
Left Bank Riparian Vegetation			No data	Right Bank Riparian Vegetation	No data			
Left Bank Stage			No data	Right Bank Stage	No data			
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments								
Barrier falls and steep cascade section.								
Site Comments			<p>Assessment done at barrier site downstream of crossing site, so no channel dimensions for the actual crossing site are available. Barrier site is long (60 m) cascade pool section, with several small falls. Channel is narrow boulder bedrock chute, with an average 30% gradient. Short ~5 m sections with gradient of &gt;50%. Falls at upstream end is 0.9 m tall, with a 0.1 m plunge pool. Not passable by juveniles or adults at any conditions. No plunge pool for adults to jump barrier falls. Juveniles not able to jump this height. Cascades section downstream is also too steep and shallow for passage. No fish potential at crossing site.</p>					
Notes:	Cover	Fish Species	Stream Class					
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<b>Fish bearing</b> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m <b>Non-fish bearing</b> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.				



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL6	Structure No.	9			
Watershed Code:	400-174068-34330	Stream Order	1					
Stream Name	Unnamed	Stream Class	S2					
Crew	IM, NN	UTM_Zone	09	UTM Northing	6030749			
Survey Date	6/15/2015			UTM Easting	523564			
Time	17:14:07	Site Length (m)	100					
Channel	Visible Channel	Features	BD - Beaver dam					
Mean Channel Width (m)	10.03	Mean Wetted Width (m)	1.48	Mean Residual Pool Depth (m)	0.18			
Mean Gradient (%)	1	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels			
In-stream Cover	Abundant	Dominant cover	LWD	Sub-dominant cover	SWD, OV			
Water Quality	Temperature (Deg C)	15.1	pH	8.3	Conductivity (uS/cm)	169	Turbidity	L-Lightly turbid
Riparian Vegetation		Crown Closure	41-70%					
Left Bank Shape	Sloping	Right Bank Shape	Sloping					
Left Bank Texture	Fines	Right Bank Texture	Fines					
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood					
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest					
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No appropriate gravels.							
Rearing	Poor - Some coastal cutthroat trout rearing habitat in stream section and in beaver ponds upstream and downstream. Good cover, but low flow depths at time of the survey.							
Overwintering	Moderate - Beaver pond may provide some overwintering habitat.							
Migration	Poor - Low flow depths, beaver dam is barrier to large-bodied fish.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Yes	Species Captured-2015	CCT	Species Stage-2015	Fry			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Channelized section upstream of beaver dam.							
Site Comments	<p>Large beaver dam located downstream of the crossing site. Large open water backflooded area upstream of dam, large sedge-dominated wetland located upstream of open water area. Short section (approx 50 m long) of defined channel was visible approximately 75 m upstream of the dam at the crossing site. Channel was shallow, with low flows and some deeper residual pools. Fish were captured in these deeper pools. Above the defined channel, another beaver dam and backflooded pool (24 m across) were present. Migration is likely limited in this system, with only small fish able to pass the beaver dams and shallow streams.</p>							
Notes:	Cover	Fish Species	Stream Class	Non-fish bearing				
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL68	Structure No.	128			
Watershed Code:	No data	Stream Order	N/A					
Stream Name	Unnamed	Stream Class	NVC					
Crew	HC, IM, WM	UTM_Zone	09	UTM Northing	5998912			
Survey Date	7/6/2016			UTM Easting	520008			
Time	15:03:13	Site Length (m)	100					
Channel	No Visible Channel	Features	None					
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A			
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A			
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A			
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation			Crown Closure	N/A				
Left Bank Shape			N/A	Right Bank Shape	N/A			
Left Bank Texture			N/A	Right Bank Texture	N/A			
Left Bank Riparian Vegetation			N/A	Right Bank Riparian Vegetation	N/A			
Left Bank Stage			N/A	Right Bank Stage	N/A			
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments								
Taken at proposed crossing location.								
Site Comments			<p>No visible channel. This is a bog drainage, with damp sphagnum moss and skunk cabbage with few intermittent pools of 0.05 m depth. Downstream of crossing drainage is through forested habitat with no evidence of overland flow, connection with downstream appears subsurface through a 2 m high valley wall. Non-fish bearing.</p>					
Notes:	Cover	Fish Species	Stream Class	Non-fish bearing				
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<p><u>Fish bearing</u></p> <p>S1 &gt; 20 m S2 &gt; 5 m - 20 m S3 1.5 m - 5 m S4 &lt; 1.5 m</p> <p>S5 &gt; 3 m S6 &lt; 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.</p>				



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL69	Structure No.	128			
Watershed Code:	No data	Stream Order	2					
Stream Name	Unnamed	Stream Class	Wetland - Fish-bea					
Crew	HC, IM, WM	UTM_Zone	09	UTM Northing	5998891			
Survey Date	7/6/2016			UTM Easting	519939			
Time	14:24:07	Site Length (m)	150					
Channel	Wetland	Features	None					
Mean Channel Width (m)	No data	Mean Wetted Width (m)	15.00	Mean Residual Pool Depth (m)	No data			
Mean Gradient (%)	No data	Dominate Substrate	Fines	Sub-dominate Substrate	Fines			
In-stream Cover	Abundant	Dominant cover	DP	Sub-dominant cover	LWD, IV, OV			
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	L-Lightly turbid
Riparian Vegetation			Crown Closure	1-20%				
Left Bank Shape	Sloping	Right Bank Shape	Sloping					
Left Bank Texture	Fines	Right Bank Texture	Fines					
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood					
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest					
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No coarse substrates at crossing location, spawning habitat is located further downstream.							
Rearing	Moderate - There is a variety of cover provided for juveniles.							
Overwintering	Poor - There is adequate depth but there is potential for low dissolved oxygen in winter.							
Migration	Moderate - Presence of beaver dams downstream that may limit migration but there are no permanent barriers.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Yes	Species Captured-2016	CO	Species Stage-2016	Fry			
Photo Comments								
Downstream extent of the survey looking downstream.								
Site Comments								
Wetland system, with wetted width of 15 m at crossing and composed of organic substrates. Beaver dams observed approximately 10 m upstream towards Bridge site 52, with flow cutting channel through. Old growth hemlock dominant forest along riparian edge with skunk cabbage, Devils club and emergent reed grasses. Yellow water lily present as in-stream vegetation. Large woody debris, water depths combined with high tannin content and undercut banks providing cover. Downstream extent of site wetland area approaches 30 m in diameter between valley walls, with large portion of wetted width hidden by emergent grasses. Fish observed feeding on surface near crossing location. No spawning due to organic substrates, poor overwintering (adequate depth, potential for low dissolved oxygen), moderate rearing, moderate migration. Habitat 400 m downstream becomes more channelized and contains coarse substrates covered in a thick layer of rust colored algae. Many beaver dams >5 were observed some without flow over top, however can not be ruled a permanent barrier. One coho captured 400 m downstream. No permanent gradient barriers observed between fish capture and crossing site. Fish bearing stream.								
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing	S5 > 3 m			
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S6 < 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	NVC No visible channel			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NCD Non-classified drainage			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD and wetlands are non-fish bearing except where noted.			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon					
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL7	Structure No.
Watershed Code:	400-174068-51121	Stream Order	1	
Stream Name	Unnamed	Stream Class	S4	
Crew	IM, NN	UTM_Zone	09	UTM Northing 6029313
Survey Date	6/16/2015			UTM Easting 522763
Time	11:08:59	Site Length (m)	100	
Channel	Visible Channel	Features	None	
Mean Channel Width (m)	1.00	Mean Wetted Width (m)	0.91	Mean Residual Pool Depth (m) 0.17
Mean Gradient (%)	6	Dominate Substrate	Fines	Sub-dominate Substrate Gravels
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover LWD, SWD

Water Quality	Temperature (Deg C)	10.3	pH	8.3	Conductivity (uS/cm)	91	Turbidity	C-Clear
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Riparian Vegetation		Crown Closure	41-70%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	None - No appropriate gravels.	
Rearing	Poor - Could provide seasonal salmonid habitat.	
Overwintering	None - No deep pools.	
Migration	Poor - Low flows, only passable by small fish.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Yes	Species Captured-2015	NFC	Species Stage-2015	N/A
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments	
Densely vegetated.	

Site Comments	
Small channel, with low flow rate and depth. Heavily vegetated, abundant overhanging vegetation provides high cover levels. Small channel only capable of providing temporary rearing habitat for juvenile fish, no access for large-bodied fish, no overwintering, no spawning habitat.	



Notes:	Cover	Fish Species	Stream Class
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback
			Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m
			Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.




# Freshwater Fish and Fish Habitat Catalog

Project No	VE52379
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Date	28-Oct-16
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Crossing Type	Transmission Line			Site Number	TL72	Structure No.		141
Watershed Code:	No data				Stream Order	1		
Stream Name	Unnamed				Stream Class	NCD		
Crew	HC, WM, IM				UTM_Zone	09	UTM Northing	5995609
Survey Date	7/5/2016						UTM Easting	519986
Time	10:04:16				Site Length (m)	100		
Channel	Non-classified Drainage				Features	None		
Mean Channel Width (m)	0.87	Mean Wetted Width (m)			0.38	Mean Residual Pool Depth (m)		0.10
Mean Gradient (%)	7	Dominate Substrate			Fines	Sub-dominate Substrate		Gravels
In-stream Cover	N/A	Dominant cover			N/A	Sub-dominant cover		N/A
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
Riparian Vegetation					Crown Closure		N/A	
Left Bank Shape		Sloping			Right Bank Shape		Sloping	
Left Bank Texture		Fines			Right Bank Texture		Fines	
Left Bank Riparian Vegetation		Coniferous			Right Bank Riparian Vegetation		Mixedwood	
Left Bank Stage		Young Forest			Right Bank Stage		Young Forest	
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence		No data					
Fished -2015	Not visited	Species Captured-2015			N/A	Species Stage-2015		N/A
Fished -2016	No	Species Captured-2016			N/A	Species Stage-2016		N/A
Photo Comments								
Site Comments								
Intermittent channel development, separated by sections of subsurface flow. Organic dominant substrates with small amounts of gravels and small amounts of water in isolated pools and little flow. When valley width increases drainage only visible due to wetland vegetation. Drainage often choked with ferns, Devils club and salmon berry. Access to fish limited due to sections of subsurface flow downstream, no drainage visible until 20 m downstream of crossing, upstream only subsurface flow with 38% gradient. Non-fish bearing.								
Notes:	Cover	Fish Species			DV	Stream Class		Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	S1 > 20 m	Fish bearing		S5 > 3 m	
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S2 > 5 m - 20 m			S6 < 3 m	
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S3 1.5 m - 5 m			NVC No visible channel	
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S4 < 1.5 m			NCD Non-classified drainage	
	DP Deep pools	CM Chum salmon	SA Salmon			NCD and wetlands are non-fish bearing except where noted.		
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSR Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL73	Structure No.	142				
Watershed Code:	No data	Stream Order	2						
Stream Name	Unnamed	Stream Class	Wetland						
Crew	HC, IM, WM	UTM_Zone	09	UTM Northing	5995553				
Survey Date	7/5/2016			UTM Easting	519961				
Time	10:39:12	Site Length (m)	100						
Channel	Wetland	Features	None						
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)	No data				
Mean Gradient (%)	No data	Dominate Substrate	Fines	Sub-dominate Substrate	No data				
In-stream Cover	N/A	Dominant cover	-	Sub-dominant cover	-				
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data	
Riparian Vegetation			Crown Closure	No data					
Left Bank Shape			No data	Right Bank Shape	No data				
Left Bank Texture			No data	Right Bank Texture	No data				
Left Bank Riparian Vegetation			No data	Right Bank Riparian Vegetation	No data				
Left Bank Stage			No data	Right Bank Stage	No data				
Habitat Comments	Fish Species	N/A							
Spawning	N/A								
Rearing	N/A								
Overwintering	N/A								
Migration	N/A								
Fish Information	Historical Fish Presence	No data							
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A				
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A				
Photo Comments									
Taken at crossing site.									
Site Comments			<p>No channel development, small sections of overland flow through wetland vegetation separated by sections of subsurface flow. Organic dominant substrates with very small amounts of gravels and small amounts of water in isolated pools and little flow. When valley width increases drainage only visible due to wetland vegetation. Drainage choked with ferns, Devils club and skunk cabbage. No access for fish due to subsurface flow and lack of channel development 26% gradient. Non-fish bearing.</p>						
Notes:	Cover	Fish Species	Stream Class	Non-fish bearing					
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.				



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Transmission Line	Site Number	TL8.1	Structure No.	22			
Watershed Code:	400-174068	Stream Order	5					
Stream Name	Lakelse River	Stream Class	S1					
Crew	IM, BH, KE, PG, MB	UTM_Zone	09	UTM Northing	6028797			
Survey Date	6/27/2015			UTM Easting	522174			
Time	11:09:07	Site Length (m)	100					
Channel	Visible Channel	Features	None					
Mean Channel Width (m)	54.67	Mean Wetted Width (m)	1.83	Mean Residual Pool Depth (m)	48.67			
Mean Gradient (%)	2	Dominate Substrate	Cobbles	Sub-dominate Substrate	Gravels			
In-stream Cover	Moderate	Dominant cover	B	Sub-dominant cover	LWD, DP			
Water Quality	Temperature (Deg C)	15.7	pH	7.8	Conductivity (uS/cm)	50	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	1-20%				
Left Bank Shape		Undercut	Right Bank Shape		Sloping			
Left Bank Texture		Fines	Right Bank Texture		Fines			
Left Bank Riparian Vegetation		Mixedwood	Right Bank Riparian Vegetation		Mixedwood			
Left Bank Stage		Mature Forest	Right Bank Stage		Mature Forest			
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Excellent - Excellent spawning, good gravel variety, pea size up to large cobble. Redd observed.							
Rearing	Excellent - Margin habitats are excellent, abundant fry observed, pools, back eddies, and large woody debris habitats available for fish.							
Overwintering	Excellent - Deep pools with good flows.							
Migration	Excellent - No barriers, good flow depths, moderate velocities.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments								
Looking upstream.								
Site Comments		<p>Excellent salmon and trout habitat, especially spawning. Large fields of gravel and cobble for spawning, redds observed. Abundant coho fry on margins using high cover. Adult trout observed under large woody debris. Freshwater mussels on margins. Somewhat limited pools, some along margins. Habitat is dominated by long shallow glide. Cover in mid channel is limited, but abundant along margins. Banks have some old growth trees.</p>						
Notes:		Cover	Fish Species	Stream Class	Non-fish bearing			
N/A Assessed but no data to report		SWD Small woody debris	AS Atlantic salmon	Fish bearing	S5 > 3 m			
		LWD Large woody debris	CC Sculpins	S1 > 20 m	S6 < 3 m			
		B Boulder	CCT Coastal cutthroat trout	S2 > 5 m - 20 m	NVC No visible channel			
		UC Undercut bank	CH Chinook salmon	S3 1.5 m - 5 m	NCD Non-classified drainage			
		DP Deep pools	CM Chum salmon	S4 < 1.5 m	NCD and wetlands are non-fish bearing except where noted.			
		OV Overhanging vegetation	CO Coho salmon					
		IV Instream vegetation	CCG Slimy sculpin					
			DV Dolly varden					
			L Lamprey					
			PK Pink salmon					
			PL Pacific Lamprey					
			RB Rainbow trout					
			SA Salmon					
			SK Sockeye salmon					
			TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro



Project No VE52379


Date 28-Oct-16




Crossing Type	Access Road	Site Number	0+220		Structure No.	
Watershed Code:	No data	Stream Order	1			
Stream Name	Unnamed	Stream Class	NCD			
Crew	IM, NN	UTM_Zone	09	UTM Northing	6025084	
Survey Date	5/13/2016			UTM Easting	521772	
Time	15:33:13	Site Length (m)	100			
Channel	Visible channel		Features	CV - Culvert		
Mean Channel Width (m)	1.04	Mean Wetted Width (m)	0.02	Mean Residual Pool Depth (m)	0.02	
Mean Gradient (%)	13	Dominate Substrate	Gravels	Sub-dominate Substrate	Cobbles	
In-stream Cover	None	Dominant cover	N/A	Sub-dominant cover	N/A	
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data
					Turbidity	No data
Riparian Vegetation			Crown Closure	21-40%		
Left Bank Shape	Sloping		Right Bank Shape	Sloping		
Left Bank Texture	Fines		Right Bank Texture	Fines		
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood		
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest		
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	None - No access to site possible, no spawning.					
Rearing	None - No access to site possible.					
Overwintering	None - Absent, no fish access.					
Migration	None - Absent, no fish access.					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
Photo Comments	Crossing site, perched culvert.					
Site Comments	<p>Dry channel present downstream of crossing and in upstream ditch. Channel extends approximately 80 m downstream of crossing, then becomes broad and poorly defined NVC. Gradient is high (18%) downstream of culvert, then lower (10%) 30 m downstream, then nearly flat (2%) beyond 60 m downstream. Scoured channel is likely a result of high energy water flowing down steep slope from ditch and perched crossing and scouring until energy is dissipated. One small pool of standing water was observed in scoured channel, approx 65 m downstream. Downstream NVC is damp and muddy, with no standing water.</p> <p>Site is located approximately 1 km upstream of a known fish passage barrier. No fish access to site currently possible. Non-fish-bearing.</p>					
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	Fish bearing		
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S5 > 3 m	
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	S6 < 3 m	
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NVC No visible channel	
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD Non-classified drainage	
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon		NCD and wetlands are non-fish bearing except where noted.	
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback			



Terrace to Kitimat Transmission Project (TKTP) Freshwater Fish and Fish Habitat Catalog						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	
Crossing Type	Access Road	Site Number	10+465		Structure No.			
Watershed Code:	No data		Stream Order	1				
Stream Name	Unnamed		Stream Class	NCD				
Crew	IM, NN		UTM_Zone	09	UTM Northing	6024060		
Survey Date	5/14/2016				UTM Easting	522036		
Time	12:29:12		Site Length (m)	100				
Channel	No Visible Channel		Features	None				
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A		
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	
Riparian Vegetation			Crown Closure		N/A			
Left Bank Shape	N/A		Right Bank Shape		N/A			
Left Bank Texture	N/A		Right Bank Texture		N/A			
Left Bank Riparian Vegetation	N/A		Right Bank Riparian Vegetation		N/A			
Left Bank Stage	N/A		Right Bank Stage		N/A			
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments								
Crossing site, showing the broad, undefined area downstream of the culvert.								
Site Comments								
<p>Culvert crossing carries ditch drainage from steep upslope area across road and drains into broad, undefined wetland area. Wetland consists of discontinuous shallow pools with abundant Instream and overhanging vegetation. 50 m downstream, the wetland joins a small scoured channel. Channel is 2 m wide, standing water depth of 20 to 50 cm, with organic substrates and very slow flow. No alluvial substrates observed. Evidence of beaver damming on small channel. Channel is very marginal fish habitat. Appears to be upper headwater drainage for tributary stream to RD115/Site 13 stream several km downstream. There is no visible channel drainage downslope of the culvert. The channel is not fish passable due to discontinuous stagnant pools with no evidence of scouring higher flows. No fish habitat present upslope of crossing, ditch flows only. Non-fish bearing at crossing site.</p>								
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					

<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	1062AR_2953		Structure No.			
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6007438			
Survey Date	7/2/2016			UTM Easting	521737			
Time	13:14:05	Site Length (m)	400					
Channel	Visible channel		Features	X - LWD jam				
Mean Channel Width (m)	1.80	Mean Wetted Width (m)	1.13	Mean Residual Pool Depth (m)	0.13			
Mean Gradient (%)	6	Dominate Substrate	Gravels	Sub-dominate Substrate	Cobbles			
In-stream Cover	Moderate	Dominant cover	LWD	Sub-dominant cover	SWD, DP, OV			
Water Quality	Temperature (Deg C)	11.0	pH	7.8	Conductivity (uS/cm)	62	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	71-90%				
Left Bank Shape	Sloping		Right Bank Shape	Sloping				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Moderate - Some patches of gravel are available for spawning. Substrates range in size from pea gravel to large cobble. Smaller substrates for trout are limited in abundance. Riffle-pool sections are limited, cascade-pools are more common.							
Rearing	Moderate - Habitat area is limited, due to low flow depths and lack of deep pools. Cascades may limit juvenile fish distribution. Cover is moderate with good diversity. Shallow pools are abundant.							
Overwintering	Poor - Limited deep pool habitat, may be low flows or dissolved oxygen during winter.							
Migration	Moderate - Many cascades may limit distribution of fish during lower flows. During high flow, adults are likely able to move throughout the system. No permanent barriers identified.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Yes	Species Captured-2016	CCT		Species Stage-2016	Fry		
Photo Comments								
Downstream extent of barrier search. No barriers found.								
Site Comments			<p>Stream is flowing in a defined channel with alternating riffle-pool and cascade-pool morphologies. Gradients are moderate (approx 5-10%), with steeper sections with short cascades. Cascades range from 0.5 m to 1.0 m in height. Fish habitat for salmonids is generally poor-moderate. Fish captured by dip netting, other juveniles observed in adjacent pools. Three coastal cutthroat trout caught during electrofishing survey immediately downstream of crossing. Fish-bearing site.</p>					
Notes:	Cover	Fish Species	Stream Class		Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.			



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	1062AR_2954		Structure No.	
Watershed Code:	No data	Stream Order	1			
Stream Name	Unnamed	Stream Class	S4			
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6007395	
Survey Date	7/2/2016			UTM Easting	521713	
Time	16:27:51	Site Length (m)	100			
Channel	Visible channel		Features	None		
Mean Channel Width (m)	1.14	Mean Wetted Width (m)	0.82	Mean Residual Pool Depth (m)	2.38	
Mean Gradient (%)	18	Dominate Substrate	Cobbles	Sub-dominate Substrate	Fines	
In-stream Cover	Abundant	Dominant cover	SWD, OV	Sub-dominant cover	N/A	
Water Quality	Temperature (Deg C)	16.1	pH	7.9	Conductivity (uS/cm)	14
					Turbidity	C-Clear
Riparian Vegetation			Crown Closure	71-90%		
Left Bank Shape	Sloping		Right Bank Shape	Vertical		
Left Bank Texture	Fines		Right Bank Texture	Fines		
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood		
Left Bank Stage	Pole/Sapling		Right Bank Stage	Pole/Sapling		
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	None - Small gravels are lacking in channel.					
Rearing	Poor - High cover with coarse substrates available, but cascade pool habitat is likely limiting access for rearing fish.					
Overwintering	None - No pools available for overwintering.					
Migration	Poor - Woody debris and gradient may reduce fish passage at flows other than freshet.					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
Photo Comments						
Taken at edge of cutblock.						
Site Comments		<p>Stream channel heavily influence by recent clear cutting from current road crossing to approximately 50 m downstream, with limited definition and overgrown by vegetation and choked its woody debris likely from mulching activities. Channel then is defined ( where measurements taken) for 30 m until confluence with known fish bearing stream of site 1062AR_2954. Fish presence is possible due to lack of barriers observed in this reach, however would likely be limited to periods of high flows during freshet.</p>				
Notes:	Cover	Fish Species	Stream Class		Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback		Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	
					S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.	

# Terrace to Kitimat Transmission Project (TKTP)


## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro


Project No VE52379



Date 28-Oct-16



Crossing Type	Access Road	Site Number	1064R_2934			Structure No.		
Watershed Code:	No data		Stream Order	N/A				
Stream Name	Unnamed		Stream Class	NVC				
Crew	IM, HC, JS		UTM_Zone	09	UTM Northing	6008446		
Survey Date	7/3/2016				UTM Easting	521451		
Time	12:40:24		Site Length (m)	100				
Channel	Other		Features	None				
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A		
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
<b>Riparian Vegetation</b>			Crown Closure		N/A			
Left Bank Shape			N/A		Right Bank Shape			N/A
Left Bank Texture			N/A		Right Bank Texture			N/A
Left Bank Riparian Vegetation			N/A		Right Bank Riparian Vegetation			N/A
Left Bank Stage			N/A		Right Bank Stage			N/A
<b>Habitat Comments</b>	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
<b>Fish Information</b>	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
<b>Photo Comments</b>								
Crossing site downstream extent.								
<b>Site Comments</b>								
Site consists of cross-road overland flow from upslope ditch to undefined, organic dominated, disconnected pools in the forest downslope. Seepage through the road is likely responsible for the majority of cross road flows. Downstream drainage with isolated pools has no channelization, but some evidence of flooding and temporary overland flow between pools. No defined channel visible at site, no fish habitat, non-fish bearing.								
<b>Notes:</b>	<b>Cover</b>	<b>Fish Species</b>	<b>Stream Class</b>		<b>Non-fish bearing</b>			
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.			



<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	1064R_2935		Structure No.			
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	S4					
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6008107			
Survey Date	7/3/2016			UTM Easting	521520			
Time	14:30:29	Site Length (m)	100					
Channel	Visible channel		Features	None				
Mean Channel Width (m)	0.82	Mean Wetted Width (m)	0.66	Mean Residual Pool Depth (m)	0.08			
Mean Gradient (%)	14	Dominate Substrate	Gravels	Sub-dominate Substrate	Fines			
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	LWD, SWD, IV			
Water Quality	Temperature (Deg C)	10.4	pH	7.7	Conductivity (uS/cm)	113	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	41-70%				
Left Bank Shape		Sloping	Right Bank Shape		Sloping			
Left Bank Texture		Fines	Right Bank Texture		Fines			
Left Bank Riparian Vegetation		Mixedwood	Right Bank Riparian Vegetation		Mixedwood			
Left Bank Stage		Young Forest	Right Bank Stage		Young Forest			
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Moderate - Small gravels present in patches throughout site. Low water depths may limit adult access.							
Rearing	Poor - Abundant cover, use limited by flow depths and some small drops.							
Overwintering	None - No deep pools.							
Migration	Poor - No permanent barriers, one steep section downstream of crossing, multiple small drops throughout, low flow depths during survey.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Yes	Species Captured-2016	NFC		Species Stage-2016	N/A		
Photo Comments								
Crossing site, showing defined channel with coarse substrates.								
Site Comments								
<p>Stream has small, defined channel, and is fed by ditch flow from upstream roadside ditch and upstream groundwater seep. Groundwater seeps likely provide majority of ditch flow, as several were observed flowing into the ditch upslope. No barriers to fish passage were observed downstream. One 20 m long steep (28%) section 20 m downstream of the crossing may limit fish access, but it may not be a complete barrier to passage. Stream may provide rearing, spawning and migration potential. Deep pools for overwintering are absent. Electrofished downstream of crossing in limit pool habitat, no fish captured. Potential fish habitat during higher flow periods, habitat potential limited during current low flow period.</p>								
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	1064R_2937	Structure No.	
Watershed Code:	No data	Stream Order	1		
Stream Name	Unnamed	Stream Class	NCD		
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6007723
Survey Date	7/3/2016			UTM Easting	521458
Time	17:26:17	Site Length (m)	100		
Channel	Non-classified Drainage	Features	None		
Mean Channel Width (m)	-	Mean Wetted Width (m)	-	Mean Residual Pool Depth (m)	-
Mean Gradient (%)	-	Dominate Substrate	Fines	Sub-dominate Substrate	Fines
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A

Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
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Riparian Vegetation		Crown Closure	N/A
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest

Habitat Comments	Fish Species	N/A
Spawning	N/A	
Rearing	N/A	
Overwintering	N/A	
Migration	N/A	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A

### Photo Comments

Crossing site.

### Site Comments

Marked crossing site on 1064 road connects roadside ditch from west to roadside ditch of east side of 1064 via cross ditch. Drainage is artificial ditch, with abundant organic materials. No channel measurements recorded. Ditch flow then drains south across Br13 road. Downstream of culvert on Br13, drainage is broad, undefined wetland area with no fish potential. Drainage is approx 15 m wide, with abundant skunk cabbage, ferns, and red alder. Fish habitat is absent downstream of Br13 road, so the marked crossing site on 1064 is non-fish bearing.



<b>Notes:</b> N/A Assessed but no data to report	<b>Cover</b> SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	<b>Fish Species</b> AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<b>Stream Class</b> <u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.
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# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	1064R_2943	Structure No.				
Watershed Code:	No data	Stream Order	N/A					
Stream Name	Unnamed	Stream Class	NVC					
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6007981			
Survey Date	7/3/2016			UTM Easting	521500			
Time	15:19:07	Site Length (m)	100					
Channel	Other	Features	None					
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A			
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A			
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A			
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation			Crown Closure	N/A				
Left Bank Shape	N/A	Right Bank Shape	N/A					
Left Bank Texture	N/A	Right Bank Texture	N/A					
Left Bank Riparian Vegetation	N/A	Right Bank Riparian Vegetation	N/A					
Left Bank Stage	N/A	Right Bank Stage	N/A					
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A			

### Photo Comments

Downstream of crossing.

### Site Comments

Crossing site has no overland flow or culvert crossing. Some subsurface water may seep through the road. Downstream is damp, undefined, unscoured wetland area. Upstream, roadside ditch carries water away from site to crossing site to south. No fish habitat, no fish.



<b>Notes:</b> N/A Assessed but no data to report	<b>Cover</b>		<b>Fish Species</b>		<b>Stream Class</b>	
	SWD	Small woody debris	AS	Atlantic salmon	<u>Fish bearing</u>	<u>Non-fish bearing</u>
	LWD	Large woody debris	CC	Sculpins	S1 > 20 m	S5 > 3 m
	B	Boulder	CCT	Coastal cutthroat trout	S2 > 5 m - 20 m	S6 < 3 m
	UC	Undercut bank	CH	Chinook salmon	S3 1.5 m - 5 m	NVC No visible channel
	DP	Deep pools	CM	Chum salmon	S4 < 1.5 m	NCD Non-classified drainage
	OV	Overhanging vegetation	CO	Coho salmon		NCD and wetlands are non-fish bearing except where noted.
	IV	Instream vegetation	CCG	Slimy sculpin		
			DV	Dolly varden		
			L	Lamprey		
			PK	Pink salmon		
			PL	Pacific Lamprey		
			RB	Rainbow trout		
			SA	Salmon		
			SK	Sockeye salmon		
			TSB	Threespine stickleback		

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro


Project No VE52379


Date 28-Oct-16





Crossing Type	Access Road	Site Number	1064R_2944		Structure No.	
Watershed Code:	No data	Stream Order	1			
Stream Name	Unnamed	Stream Class	NCD			
Crew	HC, IM, JS	UTM_Zone	09	UTM Northing	6008208	
Survey Date	7/3/2016			UTM Easting	521512	
Time	13:20:47	Site Length (m)	100			
Channel	Non-classified Drainage		Features	None		
Mean Channel Width (m)	0.30	Mean Wetted Width (m)	0.30	Mean Residual Pool Depth (m)	0.14	
Mean Gradient (%)	8	Dominate Substrate	Fines	Sub-dominate Substrate	Fines	
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A	
Water Quality	Temperature (Deg C)	6.0	pH	No data	Conductivity (uS/cm)	No data
					Turbidity	No data
Riparian Vegetation			Crown Closure	N/A		
Left Bank Shape	Sloping		Right Bank Shape	Sloping		
Left Bank Texture	Fines		Right Bank Texture	Fines		
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood		
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest		
Habitat Comments	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
<b>Photo Comments</b> Taken at downstream extent of survey where channel becomes undefined and spreads over a 15 m width with sections going subsurface in a fern dominated area.						
<b>Site Comments</b> Stream has intermittent channel development downstream of road crossing and flows subsurface for a section of approx 20 m then surfaces again. Temperature of 6 degrees and groundwater seeps near upstream reach suggests groundwater fed drainage. All organic substrates throughout with exception of road surface. No spawning potential. No fish access due to undefined drainage and sections of subsurface flow.						
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	Fish bearing	S5 > 3 m	
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S6 < 3 m	
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	NVC No visible channel	
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NCD Non-classified drainage	
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD and wetlands are non-fish bearing except where noted.	
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon			
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback			



Terrace to Kitimat Transmission Project (TKTP)										Prepared for BC Hydro		
Freshwater Fish and Fish Habitat Catalog										Project No	VE52379	
										Date	28-Oct-16	

Crossing Type	Access Road	Site Number	1064R-2946			Structure No.			
Watershed Code:	No data		Stream Order	1					
Stream Name	Unnamed		Stream Class	S4					
Crew	IM, HC, JS		UTM_Zone	09	UTM Northing	6007893			
Survey Date	7/3/2016				UTM Easting	521496			
Time	15:38:04		Site Length (m)	100					
Channel	Visible channel		Features	None					
Mean Channel Width (m)	1.44	Mean Wetted Width (m)	0.97	Mean Residual Pool Depth (m)			0.12		
Mean Gradient (%)	14	Dominate Substrate	Gravels	Sub-dominate Substrate			Fines		
In-stream Cover	Moderate	Dominant cover	LWD	Sub-dominant cover			SWD, OV		
Water Quality	Temperature (Deg C)	9.6	pH	8.0	Conductivity (uS/cm)	61	Turbidity	C-Clear	
Riparian Vegetation			Crown Closure			71-90%			
Left Bank Shape		Vertical	Right Bank Shape			Sloping			
Left Bank Texture		Fines	Right Bank Texture			Fines			
Left Bank Riparian Vegetation		Coniferous	Right Bank Riparian Vegetation			Mixedwood			
Left Bank Stage		Young Forest	Right Bank Stage			Young Forest			
Habitat Comments	Fish Species	AO - All Salmonids							
Spawning	Moderate - Gravels dominant in cascades and riffle-pool habitat.								
Rearing	Moderate - Cover provided by overhanging vegetation and woody debris.								
Overwintering	None - Lack of depth in pools which likely freeze to bottom or dry ( 0.5 m max).								
Migration	Moderate - During current flows some 0.5 m steps may limit movement of rearing fish but likely not during high flows. No barriers observed.								
Fish Information	Historical Fish Presence	No data							
Fished -2015	Not visited	Species Captured-2015	N/A			Species Stage-2015	N/A		
Fished -2016	Yes	Species Captured-2016	NFC			Species Stage-2016	N/A		
Photo Comments									
Taken where stream crosses road.									
Site Comments			<p>Ditch channel (mostly fed by ditch upstream) crosses road, flows downstream 20 m through overhanging vegetation then into a 14 m 600 mm culvert, which spans an additional abandoned road. Pond present where flow enters culvert inlet. After culvert outlet stream flows for approx 30 m under clumped large woody debris leaving stream fully covered. After woody debris pile, water flows in a step pool morphology with little cover other than tree canopy. Substrates are dominated by gravels and provide suitable spawning habitat. No barriers to fish migration observed. No fish captured during electrofishing however potential for fish presence.</p>						
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing				
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	Fish bearing					
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S5 > 3 m				
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	S6 < 3 m				
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NVC No visible channel				
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD Non-classified drainage				
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon		NCD and wetlands are non-fish bearing except where noted.				
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback						

Terrace to Kitimat Transmission Project (TKTP) Freshwater Fish and Fish Habitat Catalog						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	
Crossing Type	Access Road	Site Number	1213 R_11		Structure No.			
Watershed Code:	No data		Stream Order	1				
Stream Name	Unnamed		Stream Class	S4				
Crew	IM, HC, JS		UTM_Zone	09	UTM Northing	6029983		
Survey Date	6/28/2016				UTM Easting	524038		
Time	12:45:44		Site Length (m)	100				
Channel	Visible channel		Features	None				
Mean Channel Width (m)	1.23	Mean Wetted Width (m)	5.44	Mean Residual Pool Depth (m)		0.57		
Mean Gradient (%)	2	Dominate Substrate	Fines	Sub-dominate Substrate		Gravels		
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover		LWD, SWD, DP		
Water Quality	Temperature (Deg C)	20.1	pH	7.6	Conductivity (uS/cm)	256	Turbidity	C-Clear
Riparian Vegetation			Crown Closure		71-90%			
Left Bank Shape		Sloping		Right Bank Shape		Sloping		
Left Bank Texture		Fines		Right Bank Texture		Fines		
Left Bank Riparian Vegetation		Mixedwood		Right Bank Riparian Vegetation		Mixedwood		
Left Bank Stage		Young Forest		Right Bank Stage		Young Forest		
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No spawning gravels, all clogged with fines.							
Rearing	Poor - Abundant cover, but beaver dams are significant barriers to passage. Low flow rates likely limit dissolved oxygen.							
Overwintering	Poor - Many deep pools, small groundwater seeps likely provide overwintering flows							
Migration	Poor - Many barriers, low flows. Fish present, so access must be possible.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Yes	Species Captured-2016	CCT		Species Stage-2016	Parr		
Photo Comments								
Pond site located downstream of the crossing site.								
Site Comments			<p>Stream is dominated by multiple small beaver dams. Upstream fish passage is currently limited up dams. No evidence of high flows that may dislodge a barrier. Habitat in pools is limited, as water is stagnant, with shallow depths (0.5 m) and likely low dissolved oxygen. Larger beaver dam 30 m upstream of crossing, 1.5 m high. Coastal cutthroat trout captured at crossing at downstream end of existing wood culvert. No fish observed or captured upstream, but no permanent barriers to fish passage were observed.</p>					
Notes:	Cover	Fish Species	Stream Class		Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.			



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog


Prepared for BC Hydro


Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	1218R- 2782			Structure No.		
Watershed Code:	No data		Stream Order	1				
Stream Name	Unnamed		Stream Class	NCD				
Crew	HC, IM, JS		UTM_Zone	09	UTM Northing	6027592		
Survey Date	7/1/2016				UTM Easting	521564		
Time	12:44:17		Site Length (m)	100				
Channel	Non-classified Drainage		Features	None				
Mean Channel Width (m)	1.32	Mean Wetted Width (m)	0.85	Mean Residual Pool Depth (m)		0.18		
Mean Gradient (%)	3	Dominate Substrate	Fines	Sub-dominate Substrate		Gravels		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
Riparian Vegetation			Crown Closure		N/A			
Left Bank Shape		Sloping		Right Bank Shape		Sloping		
Left Bank Texture		Fines		Right Bank Texture		Fines		
Left Bank Riparian Vegetation		Coniferous		Right Bank Riparian Vegetation		Coniferous		
Left Bank Stage		Mature Forest		Right Bank Stage		Mature Forest		
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence		No data					
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments								
Showing termination of any channel development at the downstream extent of survey.								
Site Comments								
Most defined channel exists at road crossing. Downstream of road intermittent channel development for 30 m then wetland habitat dominated by organic substrates starts and continues for 20 m. Drainage appears to end 20 m downstream of wetland in a mud bottomed forest. Upstream of crossing no channel development, fine and organic substrates with vegetation growing throughout damp drainage area with a few isolated pools.								
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	Fish bearing				
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					

<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	1218R_204		Structure No.	
Watershed Code:	No data	Stream Order	3			
Stream Name	Unnamed	Stream Class	S3			
Crew	DF, NN	UTM_Zone	09	UTM Northing	6026301	
Survey Date	7/1/2016			UTM Easting	521832	
Time	11:07:51	Site Length (m)	300			
Channel	Dry Channel		Features	C - Cascade or chute		
Mean Channel Width (m)	1.55	Mean Wetted Width (m)	0.00	Mean Residual Pool Depth (m)	0.00	
Mean Gradient (%)	2	Dominate Substrate	Gravels	Sub-dominate Substrate	Fines	
In-stream Cover	Abundant	Dominant cover	SWD	Sub-dominant cover	LWD, OV, UC	
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data
					Turbidity	No data
Riparian Vegetation			Crown Closure	41-70%		
Left Bank Shape	Sloping		Right Bank Shape	Sloping		
Left Bank Texture	Fines		Right Bank Texture	Fines		
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood		
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest		
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	Poor - Small creek lacking sections of gravels large enough to provide any spawning opportunities. Steep gradient downstream could prevent fish from entering area.					
Rearing	Poor - Pools limited in area near culvert. Channel dry at time of survey. Poor migration downstream.					
Overwintering	None - Dry channel at time of survey. Lack of pool habitat.					
Migration	Poor - Section downstream of 25% gradient may prevent juveniles from moving upstream.					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
Photo Comments						
Approximately 40m downstream of culvert.						
Site Comments						
Substrate upstream of culvert is primarily fines with some gravels. Downstream of the culvert substrate is predominantly gravels and cobbles. Some boulder downstream of the culvert. Gradient increases approximately 100 m downstream of culvert. Channel becomes more confined with more woody debris cover.						
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing		
	LWD Large woody debris	CC Sculpins	PK Lamprey	S1 > 20 m	S5 > 3 m	
	B Boulder	CCT Coastal cutthroat trout	PL Pink salmon	S2 > 5 m - 20 m	S6 < 3 m	
	UC Undercut bank	CH Chinook salmon	RB Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel	
	DP Deep pools	CM Chum salmon	SA Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage	
	OV Overhanging vegetation	CO Coho salmon	SK Salmon		NCD and wetlands are non-fish bearing except where noted.	
	IV Instream vegetation	CCG Slimy sculpin	TSB Sockeye salmon			
			Threespine stickleback			



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog


Prepared for BC Hydro


Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	1218R_205			Structure No.		
Watershed Code:	No data		Stream Order	1				
Stream Name	Unnamed		Stream Class	NCD				
Crew	DF, NN		UTM_Zone	09	UTM Northing	6026525		
Survey Date	7/1/2016				UTM Easting	521810		
Time	12:07:51		Site Length (m)	100				
Channel	Non-classified Drainage		Features	None				
Mean Channel Width (m)	1.18	Mean Wetted Width (m)	0.00	Mean Residual Pool Depth (m)		0.00		
Mean Gradient (%)	9	Dominate Substrate	Fines	Sub-dominate Substrate		Gravels		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
Riparian Vegetation			Crown Closure		N/A			
Left Bank Shape		Sloping		Right Bank Shape		Sloping		
Left Bank Texture		Fines		Right Bank Texture		Fines		
Left Bank Riparian Vegetation		Mixedwood		Right Bank Riparian Vegetation		Mixedwood		
Left Bank Stage		Young Forest		Right Bank Stage		Young Forest		
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence		No data					
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments								
Approximately 30m downstream where the channel becomes undefined and overgrown by vegetation.								
Site Comments			<p>A larger creek parallels the road on the upstream side. A culvert allows some water to pass underneath however the majority stays on the upstream side. Water likely only enters the culvert during high flows. A discernible channel is visible for approximately 30 m downstream of the culvert before becoming undefined. Gravel and some cobble is present near the culvert outlet.</p>					
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	Fish bearing	S5 > 3 m			
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S6 < 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	NVC No visible channel			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NCD Non-classified drainage			
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD and wetlands are non-fish bearing except where noted.			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					

Terrace to Kitimat Transmission Project (TKTP) Freshwater Fish and Fish Habitat Catalog						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	1218R_206		Structure No.			
Watershed Code:	No data	Stream Order	N/A					
Stream Name	Unnamed	Stream Class	NVC					
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6027068			
Survey Date	7/1/2016			UTM Easting	521549			
Time	14:50:51	Site Length (m)	100					
Channel	Other	Features	None					
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A			
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A			
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A			
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation			Crown Closure		N/A			
Left Bank Shape		N/A	Right Bank Shape		N/A			
Left Bank Texture		N/A	Right Bank Texture		N/A			
Left Bank Riparian Vegetation		N/A	Right Bank Riparian Vegetation		N/A			
Left Bank Stage		N/A	Right Bank Stage		N/A			
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments								
Downstream unscored wetland.								
Site Comments								
Ditch drainage. No channel development upstream or downstream of road. Drainage ditches meet, flow across road through 400 mm 8 m long culvert then into undefined, unscored wetland and forested area. No fish access or habitat. Non-fish bearing.								
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	PK Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	RB Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	SA Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SK Salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	TSB Sockeye salmon					
			Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	1218R_207	Structure No.	
Watershed Code:	No data	Stream Order	N/A		
Stream Name	Unnamed	Stream Class	NVC		
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6027239
Survey Date	7/1/2016			UTM Easting	521495
Time	13:51:33	Site Length (m)	100		
Channel	Other	Features	None		
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A

Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
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Riparian Vegetation		Crown Closure	N/A
Left Bank Shape	N/A	Right Bank Shape	N/A
Left Bank Texture	N/A	Right Bank Texture	N/A
Left Bank Riparian Vegetation	N/A	Right Bank Riparian Vegetation	N/A
Left Bank Stage	N/A	Right Bank Stage	N/A

Habitat Comments	Fish Species	N/A
Spawning	N/A	
Rearing	N/A	
Overwintering	N/A	
Migration	N/A	

Fish Information	Historical Fish Presence		No data		
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments	
Crossing site.	

Site Comments	
Ditch drainage. No channel development upstream or downstream of road. Drainage ditches meet, flow across road through 400 mm 8 m long culvert then down a 10 m long steep road embankment then undefined, unscoured wetland area. No fish access. Non-fish bearing.	



Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	1218R_208	Structure No.	
Watershed Code:	No data	Stream Order	1		
Stream Name	Unnamed	Stream Class	NCD		
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6027452
Survey Date	7/1/2016			UTM Easting	521558
Time	13:19:53	Site Length (m)	100		
Channel	Other	Features	None		
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)	No data
Mean Gradient (%)	No data	Dominate Substrate	No data	Sub-dominate Substrate	No data
In-stream Cover	No data	Dominant cover	-	Sub-dominant cover	-

Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
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Riparian Vegetation		Crown Closure	No data
Left Bank Shape	No data	Right Bank Shape	No data
Left Bank Texture	No data	Right Bank Texture	No data
Left Bank Riparian Vegetation	No data	Right Bank Riparian Vegetation	No data
Left Bank Stage	No data	Right Bank Stage	No data

Habitat Comments	Fish Species	N/A
Spawning	N/A	
Rearing	N/A	
Overwintering	N/A	
Migration	N/A	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments	
Downstream extent of survey, broad undefined wetland area.	

Site Comments	
Ditch drainage site. Upstream area is roadside ditch. Dry at time of survey. Crossing site is 400 mm 8 m culvert. Downstream, short channelized section due to concentrated ditch flow. Drainage spreads out and becomes undefined wetland area 30 m downstream. Wetland has organic mud substrates, skunk cabbage, ferns. No fish access or habitat. Non-fish bearing.	



Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.



# Terrace to Kitimat Transmission Project (TKTP)


## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	1218R_210			Structure No.		
Watershed Code:	No data		Stream Order	N/A				
Stream Name	Unnamed		Stream Class	NVC				
Crew	IM, HC, JS		UTM_Zone	09	UTM Northing	6028093		
Survey Date	7/1/2016				UTM Easting	521235		
Time	09:56:23		Site Length (m)	100				
Channel	Other		Features	None				
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A		
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
<b>Riparian Vegetation</b>			Crown Closure		N/A			
Left Bank Shape		N/A	Right Bank Shape		N/A			
Left Bank Texture		N/A	Right Bank Texture		N/A			
Left Bank Riparian Vegetation		N/A	Right Bank Riparian Vegetation		N/A			
Left Bank Stage		N/A	Right Bank Stage		N/A			
<b>Habitat Comments</b>	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
<b>Fish Information</b>	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
<b>Photo Comments</b>								
Crossing site, showing the absence of a scoured channel.								
<b>Site Comments</b>								
Site is cross road drainage culvert, carrying water from upslope ditch across road. Culvert is 500 mm 8 m corrugated steel pipe. Ditch is fed by road runoff and any upslope overland flows. No stream channel exists upstream. Downstream of crossing, drainage consists of undefined overland flow route. Flow route only visible by deposited road material and organic mud deposition. Gradient 24% downslope. No fish habitat, no fish potential.								
<b>Notes:</b>	<b>Cover</b>	<b>Fish Species</b>	<b>Stream Class</b>					
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.			

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	1218R_2774	Structure No.	
Watershed Code:	No data	Stream Order	N/A		
Stream Name	Unnamed	Stream Class	NVC		
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6027124
Survey Date	7/1/2016			UTM Easting	521522
Time	14:22:54	Site Length (m)	100		
Channel	Other	Features	None		
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A

Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
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Riparian Vegetation		Crown Closure	N/A
Left Bank Shape	N/A	Right Bank Shape	N/A
Left Bank Texture	N/A	Right Bank Texture	N/A
Left Bank Riparian Vegetation	N/A	Right Bank Riparian Vegetation	N/A
Left Bank Stage	N/A	Right Bank Stage	N/A

Habitat Comments	Fish Species	N/A
Spawning	N/A	
Rearing	N/A	
Overwintering	N/A	
Migration	N/A	

Fish Information	Historical Fish Presence		No data		
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments		
Crossing site.		
Site Comments		
Ditch drainage. No channel development upstream or downstream of road. Drainage ditches meet, flow across road via cross ditch then down a 10 m long steep road embankment then undefined, unscoured wetland area. No fish access. Non-fish bearing.		



Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.



# Terrace to Kitimat Transmission Project (TKTP)


## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	1218R_2775		Structure No.	
Watershed Code:	No data	Stream Order	1			
Stream Name	Unnamed	Stream Class	S6			
Crew	DF, NN	UTM_Zone	09	UTM Northing	6026707	
Survey Date	7/1/2016			UTM Easting	521706	
Time	14:14:14	Site Length (m)	100			
Channel	Dry Channel		Features	None		
Mean Channel Width (m)	1.20	Mean Wetted Width (m)	0.00	Mean Residual Pool Depth (m)	0.00	
Mean Gradient (%)	8	Dominate Substrate	Gravels	Sub-dominate Substrate	Cobbles	
In-stream Cover	Moderate	Dominant cover	SWD	Sub-dominant cover	LWD, OV	
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data
					Turbidity	No data
Riparian Vegetation			Crown Closure	41-70%		
Left Bank Shape	Sloping		Right Bank Shape	Sloping		
Left Bank Texture	Fines		Right Bank Texture	Fines		
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood		
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest		
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	None - Non-classified drainage downstream, fish unable to access site.					
Rearing	None - Dry channel. Fish barrier downstream.					
Overwintering	None - Dry channel. No pools available for overwintering.					
Migration	None - Channel becomes non-classified drainage downstream and is fish barrier.					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
Photo Comments	Downstream of the road crossing showing shallow banks and gravel substrate.					
Site Comments	Approximately 150 m downstream from the road crossing the channel becomes NCD creating a fish barrier. Confirmed non-fish bearing.					
						
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing		
	LWD Large woody debris	CC Sculpins	PK Lamprey	S1 > 20 m	S5 > 3 m	
	B Boulder	CCT Coastal cutthroat trout	PL Pink salmon	S2 > 5 m - 20 m	S6 < 3 m	
	UC Undercut bank	CH Chinook salmon	RB Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel	
	DP Deep pools	CM Chum salmon	SA Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage	
	OV Overhanging vegetation	CO Coho salmon	SK Salmon		NCD and wetlands are non-fish bearing except where noted.	
	IV Instream vegetation	CCG Slimy sculpin	TSB Sockeye salmon			
			Threespine stickleback			

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	1218R_2776			Structure No.		
Watershed Code:	No data		Stream Order	N/A				
Stream Name	Unnamed		Stream Class	NVC				
Crew	IM, HC, JS		UTM_Zone	09	UTM Northing	6026921		
Survey Date	7/1/2016				UTM Easting	521604		
Time	15:06:06		Site Length (m)	100				
Channel	Other		Features	None				
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A		
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation			Crown Closure		N/A			
Left Bank Shape		N/A	Right Bank Shape		N/A			
Left Bank Texture		N/A	Right Bank Texture		N/A			
Left Bank Riparian Vegetation		N/A	Right Bank Riparian Vegetation		N/A			
Left Bank Stage		N/A	Right Bank Stage		N/A			
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence		No data					
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments								
Crossing site.								
Site Comments								
Ditch drainage. No channel development upstream or downstream of road. Drainage ditches meet, flow across road via cross ditch, then into a landscape depression in the forest downslope. No evidence of channelization or wetland area. No fish access. Non-fish bearing.								
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	Fish bearing	S5 > 3 m			
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S6 < 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	NVC No visible channel			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NCD Non-classified drainage			
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD and wetlands are non-fish bearing except where noted.			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog


Prepared for BC Hydro


Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	1218R_2777		Structure No.	
Watershed Code:	No data	Stream Order	1			
Stream Name	Unnamed	Stream Class	NCD			
Crew	DF, NN	UTM_Zone	09	UTM Northing	6026783	
Survey Date	7/1/2016			UTM Easting	521674	
Time	15:09:49	Site Length (m)	100			
Channel	Non-classified Drainage		Features	None		
Mean Channel Width (m)	-	Mean Wetted Width (m)	-	Mean Residual Pool Depth (m)	-	
Mean Gradient (%)	-	Dominate Substrate	Fines	Sub-dominate Substrate	Fines	
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A	
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data
					Turbidity	No data
Riparian Vegetation			Crown Closure	N/A		
Left Bank Shape	Sloping		Right Bank Shape	Sloping		
Left Bank Texture	Fines		Right Bank Texture	Fines		
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood		
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest		
Habitat Comments	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
Photo Comments						
Downstream of the road crossing showing NCD section.						
Site Comments						
Drainage crosses over road creating a 1 m wide channel approximately 10 m downstream from the crossing. The drainage then becomes NCD.						
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	Fish bearing	S5 > 3 m	
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S6 < 3 m	
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	NVC No visible channel	
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NCD Non-classified drainage	
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD and wetlands are non-fish bearing except where noted.	
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon			
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback			

<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	1218R_2781		Structure No.	
Watershed Code:	No data	Stream Order	2			
Stream Name	Unnamed	Stream Class	S4			
Crew	DF, NN	UTM_Zone	09	UTM Northing	6026630	
Survey Date	7/1/2016			UTM Easting	521758	
Time	13:28:59	Site Length (m)	200			
Channel	Dry Channel		Features	None		
Mean Channel Width (m)	1.04	Mean Wetted Width (m)	0.00	Mean Residual Pool Depth (m)	0.00	
Mean Gradient (%)	9	Dominate Substrate	Fines	Sub-dominate Substrate	Cobbles	
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	LWD, SWD	
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data
					Turbidity	No data
Riparian Vegetation			Crown Closure	1-20%		
Left Bank Shape	Sloping		Right Bank Shape	Sloping		
Left Bank Texture	Gravels		Right Bank Texture	Fines		
Left Bank Riparian Vegetation	Coniferous		Right Bank Riparian Vegetation	Mixedwood		
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest		
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	None - Limited by small channel size and lack of small gravel sections in the channel.					
Rearing	Poor - Dry channel. Watercourse likely lacks pool habitat at higher flows.					
Overwintering	None - Dry channel. Limited pool habitat available even during higher flow periods.					
Migration	Poor - Dry channel. Some areas where channel is heavily overgrown may limit distribution, however this likely does not create a barrier at higher flows.					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
Photo Comments						
<p>Downstream of the crossing site, showing the typical small, dry channel with coarse substrates.</p>						
Site Comments						
<p>Site assessed up to 200 m downstream looking for fish barriers. Channel becomes overgrown by thick vegetation and in some areas has very shallow banks. No barriers were observed. All measurements were recorded within 50 m of the road crossing. Creek flows over top of road, no culvert. Substrate downstream of the culvert is primarily fine materials with some gravels. Upstream of the culvert substrate is gravel and cobble. Creek parallels the road on the upstream side. Eroding banks observed near road.</p>						
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing		
	LWD Large woody debris	CC Sculpins	PK Lamprey	S1 > 20 m	S5 > 3 m	
	B Boulder	CCT Coastal cutthroat trout	PL Pink salmon	S2 > 5 m - 20 m	S6 < 3 m	
	UC Undercut bank	CH Chinook salmon	RB Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel	
	DP Deep pools	CM Chum salmon	SA Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage	
	OV Overhanging vegetation	CO Coho salmon	SK Salmon		NCD and wetlands are non-fish bearing except where noted.	
	IV Instream vegetation	CCG Slimy sculpin	TSB Sockeye salmon			
			Threespine stickleback			



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	1218R_2783			Structure No.		
Watershed Code:	No data		Stream Order	1				
Stream Name	Unnamed		Stream Class	NCD				
Crew	IM, HC, JE		UTM_Zone	09	UTM Northing	6027641		
Survey Date	7/1/2016				UTM Easting	521548		
Time	12:16:33		Site Length (m)	100				
Channel	Non-classified Drainage		Features	None				
Mean Channel Width (m)	1.65	Mean Wetted Width (m)	0.00	Mean Residual Pool Depth (m)		0.00		
Mean Gradient (%)	5	Dominate Substrate	Fines	Sub-dominate Substrate		Gravels		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
Riparian Vegetation			Crown Closure		N/A			
Left Bank Shape		Sloping		Right Bank Shape		Sloping		
Left Bank Texture		Fines		Right Bank Texture		Fines		
Left Bank Riparian Vegetation		Mixedwood		Right Bank Riparian Vegetation		Mixedwood		
Left Bank Stage		Young Forest		Right Bank Stage		Young Forest		
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence		No data					
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments								
Upstream of crossing, undefined section between two scoured sections.								
Site Comments			<p>Crossing site is ditch to convey flow across road. No culvert present. Stream is intermittently scoured non-classified drainage. Upstream section has short scoured sections in steeper areas, with broad, undefined areas between scoured areas. Downstream has short scoured section for 30 m, before gradient lowers to 2% and drainage becomes broad, undefined damp forested area. Channel measurements are for short scoured sections only. No fish habitat or potential. No fish.</p>					
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	Fish bearing	S5 > 3 m			
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S6 < 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	NVC No visible channel			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NCD Non-classified drainage			
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD and wetlands are non-fish bearing except where noted.			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)


## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	1218R_2785		Structure No.	
Watershed Code:	No data		Stream Order	N/A		
Stream Name	Unnamed		Stream Class	NVC		
Crew	IM, HC, JS		UTM_Zone	09	UTM Northing	6027935
Survey Date	7/1/2016				UTM Easting	521310
Time	10:18:33		Site Length (m)	100		
Channel	Other		Features	None		
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A	
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A	
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A	
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A
					Turbidity	N/A
<b>Riparian Vegetation</b>			Crown Closure	N/A		
Left Bank Shape	N/A		Right Bank Shape	N/A		
Left Bank Texture	N/A		Right Bank Texture	N/A		
Left Bank Riparian Vegetation	N/A		Right Bank Riparian Vegetation	N/A		
Left Bank Stage	N/A		Right Bank Stage	N/A		
<b>Habitat Comments</b>	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
<b>Fish Information</b>	Historical Fish Presence	No data				
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
<b>Photo Comments</b>						
Crossing site.						
<b>Site Comments</b>						
Crossing site is cross-road drainage. No culvert exists. Ditch drainage crosses road in shallow drainage ditch. Upslope, ditch drainage is only water source. Slope above ditch is steep forest, with small cliffs. Downstream of crossing, road fill drops off down steep slope 52% gradient. No channelization downslope, only road fill downslope of ditch crossing. Dry forest downslope with no channel. No fish habitat, no fish potential.						
<b>Notes:</b>	<b>Cover</b>	<b>Fish Species</b>	<b>Stream Class</b>	<b>Non-fish bearing</b>		
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.	



# Terrace to Kitimat Transmission Project (TKTP)


## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	1218R-2768			Structure No.		
Watershed Code:	No data		Stream Order	N/A				
Stream Name	Unnamed		Stream Class	NVC				
Crew	HC, IM, JS		UTM_Zone	09	UTM Northing	6027182		
Survey Date	7/1/2016				UTM Easting	521508		
Time	14:07:25		Site Length (m)	100				
Channel	Other		Features	None				
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A		
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation			Crown Closure		N/A			
Left Bank Shape	N/A		Right Bank Shape		N/A			
Left Bank Texture	N/A		Right Bank Texture		N/A			
Left Bank Riparian Vegetation	N/A		Right Bank Riparian Vegetation		N/A			
Left Bank Stage	N/A		Right Bank Stage		N/A			
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments								
Looking upstream towards the road.								
Site Comments			<p>Ditch drainage. No channel development upstream or downstream of road. Drainage ditches meet, flow across road then down a 10 m long steep road embankment then undefined, unscoured forested area. No fish access. Non-fish bearing.</p>					
Notes:			<p>N/A Assessed but no data to report</p>					
Cover			Fish Species		Stream Class			
SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation			AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin		DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback			
					Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m			
					Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.			

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	1218R-2778	Structure No.	
Watershed Code:	No data	Stream Order	N/A		
Stream Name	Unnamed	Stream Class	NVC		
Crew	HC, IM, JS	UTM_Zone	09	UTM Northing	6027297
Survey Date	7/1/2016			UTM Easting	521489
Time	13:40:38	Site Length (m)	100		
Channel	Other	Features	None		
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A

Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
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Riparian Vegetation		Crown Closure	N/A
Left Bank Shape	N/A	Right Bank Shape	N/A
Left Bank Texture	N/A	Right Bank Texture	N/A
Left Bank Riparian Vegetation	N/A	Right Bank Riparian Vegetation	N/A
Left Bank Stage	N/A	Right Bank Stage	N/A

Habitat Comments	Fish Species	N/A
Spawning	N/A	
Rearing	N/A	
Overwintering	N/A	
Migration	N/A	

Fish Information	Historical Fish Presence		No data		
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments	
Ditch drainage along road.	

Site Comments	
Ditch drainage. No channel development upstream or downstream of road. Drainage ditches meet, flow across road down a 10 m long steep road embankment then no drainage visible. No fish access. Non-fish bearing. No fisheries potential.	



Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.



# Terrace to Kitimat Transmission Project (TKTP)


## Freshwater Fish and Fish Habitat Catalog



Prepared for BC Hydro

Project No VE52379


Date 28-Oct-16




Crossing Type	Access Road	Site Number	1218R-2780			Structure No.		
Watershed Code:	No data		Stream Order	N/A				
Stream Name	Unnamed		Stream Class	NVC				
Crew	HC, JS, IM		UTM_Zone	09	UTM Northing	6026840		
Survey Date	7/1/2016				UTM Easting	521631		
Time	15:15:21		Site Length (m)	100				
Channel	Other		Features	None				
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A		
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
<b>Riparian Vegetation</b>			Crown Closure		N/A			
Left Bank Shape		N/A	Right Bank Shape		N/A			
Left Bank Texture		N/A	Right Bank Texture		N/A			
Left Bank Riparian Vegetation		N/A	Right Bank Riparian Vegetation		N/A			
Left Bank Stage		N/A	Right Bank Stage		N/A			
<b>Habitat Comments</b>	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
<b>Fish Information</b>	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
<b>Photo Comments</b>								
Crossing site.								
<b>Site Comments</b>								
Ditch drainage. No channel development upstream or downstream of road. Drainage ditches meet, flow across road via cross ditch, then into a landscape depression in the forest downslope. No evidence of channelization or wetland area. No fish access. Non-fish bearing.								
<b>Notes:</b>	<b>Cover</b>	<b>Fish Species</b>	<b>Stream Class</b>					
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.			

Terrace to Kitimat Transmission Project (TKTP) Freshwater Fish and Fish Habitat Catalog						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	
Crossing Type	Access Road	Site Number	13C-239			Structure No.		
Watershed Code:	No data		Stream Order	N/A				
Stream Name	Unnamed		Stream Class	NVC				
Crew	HC, IM, JS		UTM_Zone	09	UTM Northing	6007902		
Survey Date	7/2/2016				UTM Easting	522214		
Time	09:34:01		Site Length (m)	100				
Channel	Other		Features	None				
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)			N/A	
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation			Crown Closure		N/A			
Left Bank Shape		N/A	Right Bank Shape		N/A			
Left Bank Texture		N/A	Right Bank Texture		N/A			
Left Bank Riparian Vegetation		N/A	Right Bank Riparian Vegetation		N/A			
Left Bank Stage		N/A	Right Bank Stage		N/A			
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments								
View of road drainage ditch feeding culvert inlet.								
Site Comments								
Drainage ditch from road flows through 500 mm culvert. No defined channel downstream of culvert. Drains into steep 25% gradient forested area. Only ditch drainage channel upstream of culvert inlet. Non-fish bearing.								
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					



<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	BR13A(PTL03)_77		Structure No.	47		
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	DF, NN	UTM_Zone	09	UTM Northing	6012099			
Survey Date	7/3/2016			UTM Easting	523018			
Time	09:59:48	Site Length (m)	100					
Channel	Visible channel		Features	None				
Mean Channel Width (m)	2.93	Mean Wetted Width (m)	1.05	Mean Residual Pool Depth (m)	0.09			
Mean Gradient (%)	3	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels			
In-stream Cover	Abundant	Dominant cover	SWD	Sub-dominant cover	LWD, IV, OV			
Water Quality	Temperature (Deg C)	8.8	pH	6.4	Conductivity (uS/cm)	19	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	41-70%				
Left Bank Shape	Sloping		Right Bank Shape	Sloping				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Coniferous		Right Bank Riparian Vegetation	Coniferous				
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Moderate - Majority of channel has fine material substrate however some side and mid bars immediately downstream from the culvert may provide some spawning opportunities. Further downstream the substrate is primarily fines.							
Rearing	Moderate - Very limited flow at time of survey. Parts of channel dry. High cover and pool habitat may provide rearing habitat at higher flows.							
Overwintering	Poor - Limited flow limits overwintering areas.							
Migration	Poor - Very little flow, sections of dry channel prevent fish passage at time of survey.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Yes	Species Captured-2016	NFC		Species Stage-2016	N/A		
Photo Comments								
<p>Downstream extent of survey, showing shallow, defined channel.</p>								
Site Comments		<p>Upstream of the culvert a small stagnant pond without flow extends approximately 15 m. Channel is dry above the pond. Substrate in the upstream section is fine and organic materials. No gravel or cobble. The channel has cobble and gravel substrate from the culvert to approximately 25 m downstream. Some side bars and one mid gravel bar were observed in this section may provide spawning opportunities. Further downstream the channel returns to fine material substrate. A small amount of flow downstream of the culvert connects pools and provides connectivity.</p>						
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)


## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro


Project No VE52379


Date 28-Oct-16



Crossing Type	Access Road	Site Number	Branch 13C_240			Structure No.
Watershed Code:	No data		Stream Order	N/A		
Stream Name	Unnamed		Stream Class	NVC		
Crew	HC, IM, JS		UTM_Zone	09	UTM Northing	6007878
Survey Date	7/2/2016				UTM Easting	522217
Time	09:55:23		Site Length (m)	100		
Channel	Other		Features	None		
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A
					Turbidity	N/A
<b>Riparian Vegetation</b>			Crown Closure	N/A		
Left Bank Shape	N/A		Right Bank Shape	N/A		
Left Bank Texture	N/A		Right Bank Texture	N/A		
Left Bank Riparian Vegetation	N/A		Right Bank Riparian Vegetation	N/A		
Left Bank Stage	N/A		Right Bank Stage	N/A		
<b>Habitat Comments</b>	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
<b>Fish Information</b>	Historical Fish Presence	No data				
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
<b>Photo Comments</b>						
Crossing site looking at cross ditch.						
<b>Site Comments</b>						
Ditch drainage. Crossing is cross road drainage ditch, conveying road flow and any runoff from steep upslope areas across road. No channelization upstream or downstream. Downstream of crossing, 65% gradient slope with no channelization. Road material deposited on slope. Forested area downslope. No fish access or habitat.						
<b>Notes:</b>	<b>Cover</b>	<b>Fish Species</b>	<b>Stream Class</b>			
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.	



Terrace to Kitimat Transmission Project (TKTP) Freshwater Fish and Fish Habitat Catalog						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	Branch 13C_241			Structure No.
Watershed Code:	No data		Stream Order	N/A		
Stream Name	Unnamed		Stream Class	NVC		
Crew	IM, HC, JS		UTM_Zone	09	UTM Northing	6007852
Survey Date	7/2/2016				UTM Easting	522239
Time	10:06:35		Site Length (m)	100		
Channel	Other		Features	None		
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A
					Turbidity	N/A
Riparian Vegetation			Crown Closure		N/A	
Left Bank Shape		N/A	Right Bank Shape		N/A	
Left Bank Texture		N/A	Right Bank Texture		N/A	
Left Bank Riparian Vegetation		N/A	Right Bank Riparian Vegetation		N/A	
Left Bank Stage		N/A	Right Bank Stage		N/A	
Habitat Comments	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
Fish Information	Historical Fish Presence	No data				
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
Photo Comments						
Crossing site looking upslope in ditch.						
Site Comments						
Ditch drainage. Crossing is cross road drainage ditch, conveying road flow and any runoff from steep upslope areas across road. No channelization upstream or downstream. Downstream of crossing, 44% gradient slope with no channelization. Road material deposited on slope. Forested area downslope. No fish access or habitat.						
Notes:	Cover	Fish Species	Stream Class		Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback		Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.	

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro


Project No VE52379


Date 28-Oct-16



Crossing Type	Access Road	Site Number	Branch 13C_243			Structure No.
Watershed Code:	No data		Stream Order	N/A		
Stream Name	Unnamed		Stream Class	NVC		
Crew	IM, HC, JS		UTM_Zone	09	UTM Northing	6007780
Survey Date	7/2/2016				UTM Easting	522235
Time	10:17:01		Site Length (m)	100		
Channel	Other		Features	None		
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A
					Turbidity	N/A
Riparian Vegetation			Crown Closure	N/A		
Left Bank Shape	N/A		Right Bank Shape	N/A		
Left Bank Texture	N/A		Right Bank Texture	N/A		
Left Bank Riparian Vegetation	N/A		Right Bank Riparian Vegetation	N/A		
Left Bank Stage	N/A		Right Bank Stage	N/A		
Habitat Comments	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
Fish Information	Historical Fish Presence	No data				
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
Photo Comments						
Crossing site looking upslope.						
Site Comments						
Ditch drainage. Crossing is cross road drainage ditch, conveying road flow and any runoff from steep upslope areas across road. Logged upslope of site. No channelization upstream or downstream. Downstream of crossing, 49% gradient slope with no channelization. Road material deposited on slope. Forested area downslope. No fish access or habitat. No fish.						
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	Fish bearing		
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S5 > 3 m	
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	S6 < 3 m	
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NVC No visible channel	
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD Non-classified drainage	
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon		NCD and wetlands are non-fish bearing except where noted.	
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback			



<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	Branch 13C_244			Structure No.
Watershed Code:	No data		Stream Order	N/A		
Stream Name	Unnamed		Stream Class	NVC		
Crew	IM, HC, JS		UTM_Zone	09	UTM Northing	6007740
Survey Date	7/2/2016				UTM Easting	522230
Time	10:28:50		Site Length (m)	100		
Channel	Other		Features	None		
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A
					Turbidity	N/A
Riparian Vegetation			Crown Closure		N/A	
Left Bank Shape		N/A	Right Bank Shape		N/A	
Left Bank Texture		N/A	Right Bank Texture		N/A	
Left Bank Riparian Vegetation		N/A	Right Bank Riparian Vegetation		N/A	
Left Bank Stage		N/A	Right Bank Stage		N/A	
Habitat Comments	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
Fish Information	Historical Fish Presence	No data				
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
<b>Photo Comments</b> Crossing site looking upslope.						
<b>Site Comments</b> Road drainage. Crossing is a shallow depression on road with no cross ditch, conveying road flow and any runoff from steep upslope areas across road. No channelization upstream or downstream. Downstream of crossing, 45% gradient slope with no channelization. Forested area downslope. No fish access or habitat. No fish.						
<b>Notes:</b> N/A Assessed but no data to report						
<b>Cover</b> SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation		<b>Fish Species</b> AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin		<b>Stream Class</b> <u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m  <u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.		
		DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback				

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Branch 13C_245	Structure No.				
Watershed Code:	No data	Stream Order	N/A					
Stream Name	Unnamed	Stream Class	NVC					
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6007673			
Survey Date	7/2/2016			UTM Easting	522208			
Time	10:46:25	Site Length (m)	100					
Channel	Other	Features	None					
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A			
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A			
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A			
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation			Crown Closure		N/A			
Left Bank Shape		N/A		Right Bank Shape		N/A		
Left Bank Texture		N/A		Right Bank Texture		N/A		
Left Bank Riparian Vegetation		N/A		Right Bank Riparian Vegetation		N/A		
Left Bank Stage		N/A		Right Bank Stage		N/A		
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		

### Photo Comments

Crossing site looking upslope.



### Site Comments

Road surface drainage. Crossing is cross road drainage ditch, conveying road flow and any runoff from steep upslope areas across road. No channelization upstream or downstream. Downstream of crossing water enters ditch, flows along road then off of road embankment into forest, with no channelization. Forested area downslope. No fish access or habitat. No fish.



<b>Notes:</b> N/A Assessed but no data to report	<b>Cover</b>		<b>Fish Species</b>		<b>Stream Class</b>	
	SWD	Small woody debris	AS	Atlantic salmon	<u>Fish bearing</u>	<u>Non-fish bearing</u>
	LWD	Large woody debris	CC	Sculpins	S1 > 20 m	S5 > 3 m
	B	Boulder	CCT	Coastal cutthroat trout	S2 > 5 m - 20 m	S6 < 3 m
	UC	Undercut bank	CH	Chinook salmon	S3 1.5 m - 5 m	NVC No visible channel
	DP	Deep pools	CM	Chum salmon	S4 < 1.5 m	NCD Non-classified drainage
	OV	Overhanging vegetation	CO	Coho salmon		NCD and wetlands are non-fish bearing except where noted.
	IV	Instream vegetation	CCG	Slimy sculpin		
			DV	Dolly varden		
			L	Lamprey		
			PK	Pink salmon		
			PL	Pacific Lamprey		
			RB	Rainbow trout		
			SA	Salmon		
			SK	Sockeye salmon		
			TSB	Threespine stickleback		



Terrace to Kitimat Transmission Project (TKTP) Freshwater Fish and Fish Habitat Catalog						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	
Crossing Type	Access Road	Site Number	Branch 13C_246			Structure No.		
Watershed Code:	No data		Stream Order	N/A				
Stream Name	Unnamed		Stream Class	NVC				
Crew	HC, JS, IM		UTM_Zone	09	UTM Northing	6007665		
Survey Date	7/2/2016				UTM Easting	522192		
Time	10:52:31		Site Length (m)	100				
Channel	Other		Features	None				
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A		
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation			Crown Closure		N/A			
Left Bank Shape	N/A		Right Bank Shape		N/A			
Left Bank Texture	N/A		Right Bank Texture		N/A			
Left Bank Riparian Vegetation	N/A		Right Bank Riparian Vegetation		N/A			
Left Bank Stage	N/A		Right Bank Stage		N/A			
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence		No data					
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments								
Looking at excavated road ditch.								
Site Comments								
Excavated ditch no natural channel development. Drains over road then along the northern road ditch to site Branch 13C-247. Non-fish bearing.								
Notes:	Cover	Fish Species	DV	Lamprey	Stream Class	Non-fish bearing		
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	PK Pink salmon	Fish bearing			
	LWD Large woody debris	CC Sculpins	PL Pacific Lamprey	RB Rainbow trout	S1 > 20 m	S5 > 3 m		
	B Boulder	CCT Coastal cutthroat trout	SA Salmon	S2 > 5 m - 20 m	S3 1.5 m - 5 m	S6 < 3 m		
	UC Undercut bank	CH Chinook salmon	SK Sockeye salmon	S4 < 1.5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	TSB Threespine stickleback		NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon			NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin						

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro


Project No VE52379


Date 28-Oct-16





Crossing Type	Access Road	Site Number	Branch 13C_247			Structure No.
Watershed Code:	No data		Stream Order	N/A		
Stream Name	Unnamed		Stream Class	NVC		
Crew	IM, HC, JS		UTM_Zone	09	UTM Northing	6007703
Survey Date	7/2/2016				UTM Easting	522162
Time	10:59:59		Site Length (m)	100		
Channel	Other		Features	None		
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A
					Turbidity	N/A
<b>Riparian Vegetation</b>			Crown Closure	N/A		
Left Bank Shape	N/A		Right Bank Shape	N/A		
Left Bank Texture	N/A		Right Bank Texture	N/A		
Left Bank Riparian Vegetation	N/A		Right Bank Riparian Vegetation	N/A		
Left Bank Stage	N/A		Right Bank Stage	N/A		
<b>Habitat Comments</b>	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
<b>Fish Information</b>	Historical Fish Presence	No data				
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
<b>Photo Comments</b>						
Crossing site looking upslope at ditch.						
<b>Site Comments</b>						
Ditch drainage. Crossing is cross road drainage ditch, conveying road flow and any runoff from steep upslope areas across road. No channelization upstream or downstream. Upstream area is logged and mulched. Downstream of crossing, upstream ditch joins crossing ditch and discharges into forest with no channelization. Road material deposited on slope. Forested area downslope. No fish access or habitat. No fish.						
<b>Notes:</b>	<b>Cover</b>	<b>Fish Species</b>	<b>Stream Class</b>	<b>Non-fish bearing</b>		
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	Fish bearing		
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m	
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m	
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel	
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage	
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.	
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon			
			TSB Threespine stickleback			



Terrace to Kitimat Transmission Project (TKTP) Freshwater Fish and Fish Habitat Catalog						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	Branch 13C_257			Structure No.
Watershed Code:	No data		Stream Order	N/A		
Stream Name	Unnamed		Stream Class	NVC		
Crew	HC, IM, JS		UTM_Zone	09	UTM Northing	6007778
Survey Date	7/2/2016				UTM Easting	522235
Time	10:18:44		Site Length (m)	100		
Channel	Other		Features	None		
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A
					Turbidity	N/A
Riparian Vegetation			Crown Closure		N/A	
Left Bank Shape		N/A	Right Bank Shape		N/A	
Left Bank Texture		N/A	Right Bank Texture		N/A	
Left Bank Riparian Vegetation		N/A	Right Bank Riparian Vegetation		N/A	
Left Bank Stage		N/A	Right Bank Stage		N/A	
Habitat Comments	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
Photo Comments						
Crossing site looking upslope.						
Site Comments						
No channel development upstream or downstream of road. Evidence of surface flow at a gradient of 48% present for 30m downstream of crossing then disappears into forested vegetation.						
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing		
	LWD Large woody debris	CC Sculpins	PK Lamprey	S1 > 20 m	S5 > 3 m	
	B Boulder	CCT Coastal cutthroat trout	PL Pink salmon	S2 > 5 m - 20 m	S6 < 3 m	
	UC Undercut bank	CH Chinook salmon	RB Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel	
	DP Deep pools	CM Chum salmon	SA Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage	
	OV Overhanging vegetation	CO Coho salmon	SK Salmon		NCD and wetlands are non-fish bearing except where noted.	
	IV Instream vegetation	CCG Slimy sculpin	TSB Sockeye salmon			
			Threespine stickleback			

<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	Branch 13C_259		Structure No.	
Watershed Code:	No data		Stream Order	N/A		
Stream Name	Unnamed		Stream Class	NVC		
Crew	IM, HC, JS		UTM_Zone	09	UTM Northing	6007620
Survey Date	7/2/2016				UTM Easting	522024
Time	11:23:59		Site Length (m)	100		
Channel	Other		Features	None		
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A
					Turbidity	N/A
Riparian Vegetation			Crown Closure		N/A	
Left Bank Shape		N/A	Right Bank Shape		N/A	
Left Bank Texture		N/A	Right Bank Texture		N/A	
Left Bank Riparian Vegetation		N/A	Right Bank Riparian Vegetation		N/A	
Left Bank Stage		N/A	Right Bank Stage		N/A	
Habitat Comments	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
Fish Information	Historical Fish Presence	No data				
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
Photo Comments						
Crossing site.						
Site Comments						
<p>Cross road drainage ditch. Conveys flow from upslope forest across road to logged area and forest beyond. Downstream, drainage likely joins drainage of existing culvert to north of this crossing. No channelization upstream or downstream of crossing site. No fish habitat or access. No fish.</p>						
Notes:	Cover	Fish Species		Stream Class		
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.	



# Terrace to Kitimat Transmission Project (TKTP)


## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Branch 13C_261			Structure No.
Watershed Code:	No data		Stream Order	N/A		
Stream Name	Unnamed		Stream Class	NVC		
Crew	IM, HC, JS		UTM_Zone	09	UTM Northing	6007572
Survey Date	7/2/2016				UTM Easting	521977
Time	11:25:25		Site Length (m)	100		
Channel	Other		Features	None		
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A
					Turbidity	N/A
<b>Riparian Vegetation</b>			Crown Closure	N/A		
Left Bank Shape	N/A		Right Bank Shape	N/A		
Left Bank Texture	N/A		Right Bank Texture	N/A		
Left Bank Riparian Vegetation	N/A		Right Bank Riparian Vegetation	N/A		
Left Bank Stage	N/A		Right Bank Stage	N/A		
<b>Habitat Comments</b>	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
<b>Fish Information</b>	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
<b>Photo Comments</b>						
Crossing site.						
<b>Site Comments</b>						
Ditch drainage. Crossing is cross road drainage ditch. No channelization upstream or downstream. Road material deposited on slope. Drains into deforested cut block area down slope. At time of survey there is a small amount of visible overland flow. No fish access or habitat. No fish.						
<b>Notes:</b>	<b>Cover</b>	<b>Fish Species</b>	<b>Stream Class</b>			
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.	

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Branch 13C_2829			Structure No.
Watershed Code:	No data		Stream Order	N/A		
Stream Name	Unnamed		Stream Class	NVC		
Crew	IM, HC, JS		UTM_Zone	09	UTM Northing	6004766
Survey Date	7/2/2016				UTM Easting	521413
Time	12:06:37		Site Length (m)	100		
Channel	Other		Features	None		
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A
					Turbidity	N/A
<b>Riparian Vegetation</b>			Crown Closure	N/A		
Left Bank Shape	N/A		Right Bank Shape	N/A		
Left Bank Texture	N/A		Right Bank Texture	N/A		
Left Bank Riparian Vegetation	N/A		Right Bank Riparian Vegetation	N/A		
Left Bank Stage	N/A		Right Bank Stage	N/A		
<b>Habitat Comments</b>	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
<b>Fish Information</b>	Historical Fish Presence	No data				
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
<b>Photo Comments</b>						
Crossing site.						
<b>Site Comments</b>						
Crossing site is cross road drainage ditch. Conveys excess flow from Branch 13C_2842 crossing ditch across road, into unchannelized forest, then to the drainage downstream of Branch 13C_2842. Steep slope 50% down slope of crossing site. Site is upstream of site TL20A, a marked non-fish site. No fish habitat or access. No fish.						



Notes:	Cover	Fish Species	Stream Class
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	<b>Fish bearing</b> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m <b>Non-fish bearing</b> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.

DV	Dolly varden
L	Lamprey
PK	Pink salmon
PL	Pacific Lamprey
RB	Rainbow trout
SA	Salmon
SK	Sockeye salmon
TSB	Threespine stickleback



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road		Site Number		Branch 13C_2838		Structure No.	
Watershed Code:	No data			Stream Order	N/A			
Stream Name	Unnamed			Stream Class	NVC			
Crew	IM, HC, JS			UTM_Zone	09	UTM Northing		6004765
Survey Date	7/2/2016					UTM Easting		521411
Time	12:15:59			Site Length (m)	100			
Channel	Other			Features	None			
Mean Channel Width (m)	N/A	Mean Wetted Width (m)		N/A	Mean Residual Pool Depth (m)			N/A
Mean Gradient (%)	N/A	Dominate Substrate		N/A	Sub-dominate Substrate			N/A
In-stream Cover	N/A	Dominant cover		N/A	Sub-dominant cover			N/A
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation				Crown Closure		N/A		
Left Bank Shape		N/A		Right Bank Shape		N/A		
Left Bank Texture		N/A		Right Bank Texture		N/A		
Left Bank Riparian Vegetation		N/A		Right Bank Riparian Vegetation		N/A		
Left Bank Stage		N/A		Right Bank Stage		N/A		
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence		No data					
Fished -2015	No	Species Captured-2015		N/A		Species Stage-2015		N/A
Fished -2016	No	Species Captured-2016		N/A		Species Stage-2016		N/A

### Photo Comments


Crossing site.


### Site Comments

Crossing site is cross road drainage ditch. Conveys flow from road and steep slope above crossing across road, into unchannelized clear-cut, then forest, then to the drainage downstream of Branch 13C\_2842. Steep slope 70% down and up slope of crossing site. Site is upstream of site TL20A, a marked non-fish site. No fish habitat or access. No fish.



<b>Notes:</b> N/A Assessed but no data to report	<b>Cover</b> SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	<b>Fish Species</b> AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<b>Stream Class</b> <u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.
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Terrace to Kitimat Transmission Project (TKTP) Freshwater Fish and Fish Habitat Catalog						Prepared for BC Hydro			
						Project No	VE52379		
						Date	28-Oct-16		

Crossing Type	Access Road	Site Number	Branch 13C_2842		Structure No.
Watershed Code:	No data	Stream Order	1		
Stream Name	Unnamed	Stream Class	S6		
Crew	HC, IM, JS	UTM_Zone	09	UTM Northing	6004798
Survey Date	7/2/2016			UTM Easting	521398
Time	12:07:22	Site Length (m)	100		
Channel	Other	Features	None		
Mean Channel Width (m)	1.52	Mean Wetted Width (m)	0.00	Mean Residual Pool Depth (m)	0.00
Mean Gradient (%)	10	Dominate Substrate	Cobbles	Sub-dominate Substrate	Boulders
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	B
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)
					No data
					Turbidity
					No data
Riparian Vegetation			Crown Closure	71-90%	
Left Bank Shape	Sloping		Right Bank Shape	Sloping	
Left Bank Texture	Fines		Right Bank Texture	Fines	
Left Bank Riparian Vegetation	Coniferous		Right Bank Riparian Vegetation	Coniferous	
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest	
Habitat Comments	Fish Species	AO - All Salmonids			
Spawning	None - No fish habitat due to lack of water and prohibitively high gradient at a known barrier site downstream.				
Rearing	None - No fish habitat due to lack of water and prohibitively high gradient at a known barrier site downstream.				
Overwintering	None - No fish habitat due to lack of water and prohibitively high gradient at a known barrier site downstream.				
Migration	None - No fish habitat due to lack of water and prohibitively high gradient at a known barrier site downstream.				
Fish Information	Historical Fish Presence	No data			
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A
Photo Comments					
Taken approx 30 m downstream of road.					
Site Comments					
<p>Site is upstream of a known barrier at site TL20A. Channel development is present downstream of road with cobble gravel substrates. Upstream of road crossing channel is filled with boulder and large woody debris. Confluence with site Branch 13C_2855 located approx 30 m downstream. Red alder dominant with western hemlock. Channel dry during time of survey. No fish access or habitat.</p>					
Notes:	Cover	Fish Species		Stream Class	
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16




Crossing Type	Access Road	Site Number	Branch 13C_2855	Structure No.	
Watershed Code:	910-665062-20282	Stream Order	1		
Stream Name	Unnamed	Stream Class	S6		
Crew	BH, IM	UTM_Zone	09	UTM Northing	6004810
Survey Date	6/22/2015			UTM Easting	521387
Time	15:54:19	Site Length (m)	100		
Channel	Dry Channel	Features	CV - culvert		
Mean Channel Width (m)	1.52	Mean Wetted Width (m)	0.00	Mean Residual Pool Depth (m)	0.00
Mean Gradient (%)	10	Dominate Substrate	Cobbles	Sub-dominate Substrate	Boulders
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	B

Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
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Riparian Vegetation		Crown Closure	71-90%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Coniferous	Right Bank Riparian Vegetation	Coniferous
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	None - No fish habitat due to lack of water and prohibitively high gradient downstream.	
Rearing	None - No fish habitat due to lack of water and prohibitively high gradient downstream.	
Overwintering	None - No fish habitat due to lack of water and prohibitively high gradient downstream.	
Migration	None - No fish habitat due to lack of water and prohibitively high gradient downstream.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments	
On road looking uphill.	
Site Comments	
Site is located upstream of known barrier at TL20A crossing. Stream has water only in spring or during storm events. No fish access.	

Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Branch 13C-2804			Structure No.
Watershed Code:	No data		Stream Order	N/A		
Stream Name	Unnamed		Stream Class	NVC		
Crew	HC, JS, IM		UTM_Zone	09	UTM Northing	6007700
Survey Date	7/2/2016				UTM Easting	522228
Time	10:34:53		Site Length (m)	100		
Channel	Other		Features	None		
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A
					Turbidity	N/A
<b>Riparian Vegetation</b>			Crown Closure		N/A	
Left Bank Shape	N/A		Right Bank Shape		N/A	
Left Bank Texture	N/A		Right Bank Texture		N/A	
Left Bank Riparian Vegetation	N/A		Right Bank Riparian Vegetation		N/A	
Left Bank Stage	N/A		Right Bank Stage		N/A	
<b>Habitat Comments</b>	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
<b>Fish Information</b>	Historical Fish Presence	No data				
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
<b>Photo Comments</b>						
Looking upslope at road ditch drainage.						
<b>Site Comments</b>						
No channel development upstream or downstream of road. Evidence of surface flow at a gradient of 43% present for 10m downstream of crossing then joins with drainage across road. Non-fish bearing.						
<b>Notes:</b>	<b>Cover</b>	<b>Fish Species</b>	<b>Stream Class</b>	<b>Non-fish bearing</b>		
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.	

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro


Project No VE52379


Date 28-Oct-16



Crossing Type	Access Road	Site Number	Bridge Site 17	Structure No.				
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	HC, IM, JS	UTM_Zone	09	UTM Northing	6009474			
Survey Date	6/29/2016			UTM Easting	521184			
Time	16:46:51	Site Length (m)	100					
Channel	Visible channel	Features	BR - Bridge					
Mean Channel Width (m)	2.96	Mean Wetted Width (m)	1.90	Mean Residual Pool Depth (m)	0.22			
Mean Gradient (%)	3	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels			
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	DP			
Water Quality	Temperature (Deg C)	18.8	pH	7.5	Conductivity (uS/cm)	56	Turbidity	C-Clear
Riparian Vegetation		Crown Closure	21-40%					
Left Bank Shape	Sloping	Right Bank Shape	Undercut					
Left Bank Texture	Fines	Right Bank Texture	Fines					
Left Bank Riparian Vegetation	Deciduous	Right Bank Riparian Vegetation	Mixedwood					
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest					
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Moderate - Downstream of bridge near confluence gravels present, upstream of bridge no spawning habitat is available.							
Rearing	Moderate - Low flows with gravel substrates downstream of bridge.							
Overwintering	Poor - Depths of 0.8 m in impounded pool habitat, with low flows.							
Migration	Poor - Under current conditions however under high flows beaver dams may breach and migration would improve.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Yes	Species Captured-2016	CO	Species Stage-2016	Fry			
Photo Comments	Confluence with Lone Wolf Creek.							
Site Comments	<p>Beaver dam immediately upstream of existing bridge structure has impounded upstream habitat causing a lack of defined channel, and habitat is composed of fine and organic substrates and resembles wetland habitat. Upstream of dam wetted width is approximately 3m with valley width of 20 m. Additional dams and beaver activity present upstream. Coho observed and captured upstream and downstream of bridge structure via dip netting. Due to presence of breeding amphibians at site, electrofishing was not conducted. Fish bearing stream, despite temporary barriers. Crossing is located 20 m upstream of confluence with Lone Wolf Creek, a known fish-bearing creek.</p>							
Notes:	Cover	Fish Species	DV	Stream Class	Fish bearing	Non-fish bearing		
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	S1 > 20 m	S5 > 3 m			
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	DP Deep pools	CM Chum salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					



<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	Bridge Site 18		Structure No.			
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6009665			
Survey Date	6/29/2016			UTM Easting	520564			
Time	14:55:32	Site Length (m)	300					
Channel	Visible channel		Features	BR - Bridge				
Mean Channel Width (m)	4.01	Mean Wetted Width (m)	2.11	Mean Residual Pool Depth (m)	0.33			
Mean Gradient (%)	3	Dominate Substrate	Gravels	Sub-dominate Substrate	Fines			
In-stream Cover	Moderate	Dominant cover	OV	Sub-dominant cover	LWD,DP,UC			
Water Quality	Temperature (Deg C)	11.6	pH	8.0	Conductivity (uS/cm)	60	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	41-70%				
Left Bank Shape	Undercut		Right Bank Shape	Sloping				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Good - Abundant gravel, good for trout and smaller salmon species. Very close to Wedeene River, good access, good flow depths.							
Rearing	Excellent - Abundant young-of-the-year and 1+ coho observed and captured. Juveniles observed rearing throughout stream between bridge and Wedeene. Good cover availability and diversity.							
Overwintering	Good - Frequent deep pools on channel margins under large woody debris. Good flows, likely remains flowing all year round. Likely limited available habitat for adults. Wedeene likely provides overwintering for adults.							
Migration	Good - No barriers to fish passage observed between bridge and Wedeene. Good flow depths, may be limited at higher flows for larger bodied fish.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Yes	Species Captured-2016	CO		Species Stage-2016	Fry		
<b>Photo Comments</b> Upstream extent of survey, showing the well-defined channel with gravel substrates upstern of the bridge site.								
<b>Site Comments</b> Stream is good quality salmonid habitat, excellent for juveniles. Abundant coho young of the year and 1+ age observed. No barriers between bridge and Wedeene River. Good habitat variety and cover variety. Typical low gradient riffle pool habitat with large woody debris creating diversity. Abundant small and large gravel, minimal cobble. Fish bearing.								
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	PK Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	RB Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	SA Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SK Salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	TSB Sockeye salmon					
			TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Bridge Site 37	Structure No.	
Watershed Code:	No data	Stream Order	1		
Stream Name	Unnamed	Stream Class	S5		
Crew	HC, IM, JS	UTM_Zone	09	UTM Northing	6007694
Survey Date	6/30/2016			UTM Easting	522211
Time	13:49:23	Site Length (m)	100		
Channel	Other	Features	None		
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)	No data
Mean Gradient (%)	No data	Dominate Substrate	No data	Sub-dominate Substrate	No data
In-stream Cover	No data	Dominant cover	No data	Sub-dominant cover	No data
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)
					No data
					Turbidity
					No data
Riparian Vegetation			Crown Closure		No data
Left Bank Shape	No data		Right Bank Shape		No data
Left Bank Texture	No data		Right Bank Texture		No data
Left Bank Riparian Vegetation	No data		Right Bank Riparian Vegetation		No data
Left Bank Stage	No data		Right Bank Stage		No data
Habitat Comments	Fish Species	N/A			
Spawning	N/A				
Rearing	N/A				
Overwintering	N/A				
Migration	N/A				
Fish Information	Historical Fish Presence	No data			
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A
Photo Comments	Crossing site. Looking upstream at existing bridge.				
Site Comments	Steep (22- 25%) gradient stream with subsurface flow (dry) until approximately 30 m downstream of crossing structure. Intermittent surface flow then present downstream, surface flow upstream of bridge would only be possible during extreme high water conditions. Water velocity is likely to be high during this time due to boulder and woody debris jams and likely impassable to fish. 2 m drop barrier filled with cobble boulder and large woody debris downstream of bridge with 10 cm plunge pool. Substrates gravels cobbles, boulders, and bedrock. Entrenched with bedrock outcroppings on valley walls. Downstream of first barrier habitat is step pool with abundant cascade and waterfall. Impassable to				
Notes:	Cover	Fish Species	Stream Class		
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.	

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Bridge Site 52	Structure No.
Watershed Code:	No data	Stream Order	2	
Stream Name	Unnamed	Stream Class	Wetland - Fish-bea	
Crew	HC, IM, WM	UTM_Zone	09	UTM Northing 5998891
Survey Date	7/6/2016			UTM Easting 519939
Time	14:24:07	Site Length (m)	150	
Channel	Wetland	Features	None	
Mean Channel Width (m)	No data	Mean Wetted Width (m)	15.00	Mean Residual Pool Depth (m) No data
Mean Gradient (%)	No data	Dominate Substrate	Fines	Sub-dominate Substrate Fines
In-stream Cover	Abundant	Dominant cover	DP	Sub-dominant cover LWD, IV, OV
Water Quality	Temperature (Deg C)	No data	pH	No data
			Conductivity (uS/cm)	No data
				Turbidity
				L-Lightly turbid
Riparian Vegetation		Crown Closure	1-20%	
Left Bank Shape	Sloping	Right Bank Shape	Sloping	
Left Bank Texture	Fines	Right Bank Texture	Fines	
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood	
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest	
Habitat Comments	Fish Species	AO - All Salmonids		
Spawning	None - No coarse substrates at crossing location, spawning habitat is located further downstream.			
Rearing	Moderate - There is a variety of cover provided for juveniles.			
Overwintering	Poor - There is adequate depth but there is potential for low dissolved oxygen in winter.			
Migration	Moderate - Presence of beaver dams downstream that may limit migration but there are no permanent barriers.			
Fish Information	Historical Fish Presence	No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015 N/A
Fished -2016	Yes	Species Captured-2016	CO	Species Stage-2016 Fry
Photo Comments	Downstream extent of the survey looking upstream.			
Site Comments	<p>Wetland system, with wetted width of 15 m at crossing and composed of organic substrates. Beaver dams observed approximately 10 m upstream, with flow cutting channel through. Old growth hemlock dominant forest along riparian edge with skunk cabbage, Devils club and emergent reed grasses. Yellow water lily present as in-stream vegetation. Large woody debris, water depths combined with high tannin content and undercut banks providing cover. Downstream of TL69 wetland area approaches 30 m in diameter between valley walls, with large portion of wetted width hidden by emergent grasses. Fish observed feeding on surface near crossing location. No spawning due to organic substrates, poor overwintering (adequate depth, potential for low dissolved oxygen), moderate rearing, moderate migration. Habitat 400 m downstream becomes more channelized and contains coarse substrates covered in a thick layer of rust colored algae. Many beaver dams &gt;5 were observed some without flow over top, however can not be ruled a permanent barrier. One coho captured 400 m downstream. No permanent gradient barriers observed between fish capture and crossing site. Fish bearing stream.</p>			
Notes:	Cover	Fish Species	Stream Class	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	Fish bearing	Non-fish bearing
	LWD Large woody debris	CC Sculpins	S1 > 20 m	S5 > 3 m
	B Boulder	CCT Coastal cutthroat trout	S2 > 5 m - 20 m	S6 < 3 m
	UC Undercut bank	CH Chinook salmon	S3 1.5 m - 5 m	NVC No visible channel
	DP Deep pools	CM Chum salmon	S4 < 1.5 m	NCD Non-classified drainage
	OV Overhanging vegetation	CO Coho salmon		NCD and wetlands are non-fish bearing except where noted.
	IV Instream vegetation	CCG Slimy sculpin		
		DV Dolly varden		
		L Lamprey		
		PK Pink salmon		
		PL Pacific Lamprey		
		RB Rainbow trout		
		SA Salmon		
		SK Sockeye salmon		
		TSB Threespine stickleback		



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	C51	Structure No.
Watershed Code:	No data	Stream Order	N/A	
Stream Name	Unnamed	Stream Class	NCD	
Crew	IM, NN	UTM_Zone	09	UTM Northing 5994041
Survey Date	5/12/2016			UTM Easting 519506
Time	12:25:57	Site Length (m)	100	
Channel	No Visible Channel	Features	None	
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m) N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover N/A
Water Quality	Temperature (Deg C)	N/A	pH	N/A
			Conductivity (uS/cm)	N/A
				Turbidity N/A
Riparian Vegetation			Crown Closure	N/A
Left Bank Shape	N/A		Right Bank Shape	N/A
Left Bank Texture	N/A		Right Bank Texture	N/A
Left Bank Riparian Vegetation	N/A		Right Bank Riparian Vegetation	N/A
Left Bank Stage	N/A		Right Bank Stage	N/A
Habitat Comments	Fish Species	N/A		
Spawning	N/A			
Rearing	N/A			
Overwintering	N/A			
Migration	N/A			
Fish Information	Historical Fish Presence	No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015 N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016 N/A
Photo Comments	Downstream extent of survey is non-classified drainage (<30 m in length).			
Site Comments	Non continuous sections of channel with small pools. Dry sections of channel throughout. Flows very low, running subsurface in places and overland in others. Vegetated channel with small patches of alluvial sediments, dominated by organic debris, shows minimal evidence of scouring flows during freshet. Small discontinuous channelized sections up to 30 m at surveyed sites, upper and lower ends becomes undefined non-visible channel. Maximum pool depth is 15 cm, residual pool of 10 cm. Non-fish bearing due to discontinuous habitat, low flows, lack of evidence of higher flows during freshet.			
Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	C63	Structure No.				
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	NCD - Fish-bearing					
Crew	IM, NN	UTM_Zone	09	UTM Northing	5992113			
Survey Date	5/12/2016			UTM Easting	520339			
Time	17:02:11	Site Length (m)	100					
Channel	Visible channel	Features	CV - Culvert					
Mean Channel Width (m)	0.00	Mean Wetted Width (m)	31.67	Mean Residual Pool Depth (m)	0.54			
Mean Gradient (%)	0	Dominate Substrate	Fines	Sub-dominate Substrate	Fines			
In-stream Cover	Abundant	Dominant cover	IV	Sub-dominant cover	SWD, DP, OV			
Water Quality	Temperature (Deg C)	16.5	pH	6.4	Conductivity (uS/cm)	29	Turbidity	M - Moderately
Riparian Vegetation			Crown Closure	21-40%				
Left Bank Shape	Sloping		Right Bank Shape	Sloping				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No gravels present.							
Rearing	Poor - Possible access during high water for juvenile fish. Water quality is currently poor and access is not possible. Low water may lead to stranding.							
Overwintering	Poor - Beaver pool is shallow with low flows and likely low dissolved oxygen. Fish may be stranded if overwintering in pond.							
Migration	Poor - Migration not currently possible due to low water. Possible in high flow conditions only.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Yes	Species Captured-2016	NFC	Species Stage-2016	N/A			
Photo Comments	Upstream extent of survey.							
Site Comments	<p>Large beaver impounded area located upstream of culvert crossing. Culvert is blocked with beaver debris and is not passing water. Beaver impounded area is very broad and shallow, with high temperature and low pH. No fish were captured with minnow traps placed in beaver pond. Suspect no fish currently present in beaver pond. Downstream consists of broad, flat, dewatered and muddy braided channels, with abundant vegetation in channels. Water is only present in discontinuous small pools. No scour observed downstream or alluvial sediments. Fish access not possible during low flows. During floods, access may be possible from downstream fish bearing streams. Habitat would be marginal during flood conditions, currently habitat is not available downstream. Seasonal fish use during high flow conditions is possible.</p>							
Notes:	Cover	Fish Species	DV	Stream Class				
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	Fish bearing				Non-fish bearing
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m				S5 > 3 m
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m				S6 < 3 m
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m				NVC No visible channel
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m				NCD Non-classified drainage
	OV Overhanging vegetation	CO Coho salmon	SA Salmon					NCD and wetlands are non-fish bearing except where noted.
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	CX-1	Structure No.				
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	S4					
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6031466			
Survey Date	7/4/2016			UTM Easting	523629			
Time	09:34:02	Site Length (m)	100					
Channel	Intermittent Water in Channel	Features	None					
Mean Channel Width (m)	0.71	Mean Wetted Width (m)	0.26	Mean Residual Pool Depth (m)	0.05			
Mean Gradient (%)	8	Dominate Substrate	Fines	Sub-dominate Substrate	Fines			
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	LWD, SWD			
Water Quality	Temperature (Deg C)	11.9	pH	7.5	Conductivity (uS/cm)	122	Turbidity	C-Clear
Riparian Vegetation		Crown Closure	41-70%					
Left Bank Shape	Sloping	Right Bank Shape	Sloping					
Left Bank Texture	Fines	Right Bank Texture	Fines					
Left Bank Riparian Vegetation	Coniferous	Right Bank Riparian Vegetation	Coniferous					
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest					
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No spawning gravels, abundant fines.							
Rearing	Poor - Currently no habitat due to low water. Possible for rearing only during high water if access is possible. Small habitat area available, narrow channel, no deep pools.							
Overwintering	None - No deep pools, small channels, likely low flows during winter.							
Migration	Poor - Only possible during high water periods. No access currently. No identified barriers.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Approximate crossing site.							
Site Comments	Stream is narrow, defined channel with no flowing water. Channel is full of fallen woody debris in places, with abundant vegetation in and beside the channel. These woody debris accumulations may limit fish access during high water, but are not rated as permanent barriers. Some small residual pools are present, with depths of less than 0.1 m and widths of 0.3 to 0.2 m. Currently, no fish habitat due to low water. May offer limited rearing habitat only during high flow periods. Not fished, no sufficient water depths.							
Notes:	Cover	Fish Species	DV	Stream Class	Fish bearing	Non-fish bearing		
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	S1 > 20 m	S5 > 3 m			
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	DP Deep pools	CM Chum salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	PTPL rd-11_2923		Structure No.	
Watershed Code:	No data	Stream Order	1			
Stream Name	Unnamed	Stream Class	S4			
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6008959	
Survey Date	6/30/2016			UTM Easting	522349	
Time	14:46:24	Site Length (m)	100			
Channel	Dry Channel		Features	BR - Bridge		
Mean Channel Width (m)	1.29	Mean Wetted Width (m)	0.00	Mean Residual Pool Depth (m)	0.00	
Mean Gradient (%)	7	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels	
In-stream Cover	Abundant	Dominant cover	SWD	Sub-dominant cover	LWD, B,OV	
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data
					Turbidity	No data
Riparian Vegetation			Crown Closure	71-90%		
Left Bank Shape	Undercut		Right Bank Shape	Sloping		
Left Bank Texture	Fines		Right Bank Texture	Fines		
Left Bank Riparian Vegetation	Coniferous		Right Bank Riparian Vegetation	Coniferous		
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest		
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	None - Spawning gravels are absent near the crossing. Downstream wetted stream has many gravels suitable for spawning. Crossing site dry in June 2016.					
Rearing	Poor - Stream is ephemeral, some cascades and drops are present that may limit juvenile access to crossing site.					
Overwintering	None - No deep pools near crossing site.					
Migration	Poor - Limited by lack of flow depths, cascades and small falls that may be partial barriers.					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
Photo Comments						
Upstream extent of survey, upstream of existing bridge.						
Site Comments		<p>Channel is dry at site, with well defined channel from 30 m upstream and downstream. Above 30 m, channel becomes intermittently defined. Channel below crossing site has some small steps and cascades that may limit fish access, but are not confirmed barriers. At high flows, they may be passable by fish. Channel is dry downstream for approx 100 m, before groundwater seep feeds channel and provides flow. Downstream wetted channel supports juvenile fish. Several small salmonids were observed, including one coho fry. Crossing site may be accessible to fish during high flows. No barriers between fish bearing wetted stream and crossing site, gradient is moderate. Crossing site is likely fish bearing.</p>				
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing		
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m	
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m	
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel	
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage	
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.	
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon			
			TSB Threespine stickleback			

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	PTPL rd11-2921		Structure No.	
Watershed Code:	No data	Stream Order	1			
Stream Name	Unnamed	Stream Class	S4			
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6009131	
Survey Date	7/3/2016			UTM Easting	522453	
Time	10:31:54	Site Length (m)	150			
Channel	Visible channel		Features	None		
Mean Channel Width (m)	1.20	Mean Wetted Width (m)	0.82	Mean Residual Pool Depth (m)	0.14	
Mean Gradient (%)	9	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels	
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	LWD, SWD, DP	
Water Quality	Temperature (Deg C)	11.3	pH	7.5	Conductivity (uS/cm)	22
					Turbidity	C-Clear
Riparian Vegetation			Crown Closure	71-90%		
Left Bank Shape	Sloping		Right Bank Shape	Undercut		
Left Bank Texture	Fines		Right Bank Texture	Fines		
Left Bank Riparian Vegetation	Coniferous		Right Bank Riparian Vegetation	Coniferous		
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest		
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	None - Clean spawning gravel was absent, abundant fines clogged any coarse materials. Gravel was scarce.					
Rearing	Poor - Habitat for rearing was limited during current flow conditions. Isolated pools were only spots with adequate depth, riffle sections were very shallow and provided very poor or no habitat. Juveniles may be stranded in pools. During high water, rearing is likely possible, with poor quality.					
Overwintering	None - Deep pools absent, potential low winter flows.					
Migration	Poor - No barriers identified within 200 m of site. Migration is limited by low depths currently. Access likely possible during high flow periods.					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	NFC		Species Stage-2016	N/A
Photo Comments						
Downstream extent of sites.						
Site Comments		<p>Site consists of a small, visible channel, downstream of a clearcut and mulched road right of way. Disturbance has eliminated the channel at the crossing site, but it is visible downstream. Upstream was low gradient small channel, dominated by fines and organic debris. Water is currently low, with minimal potential fish habitat. During high water, rearing and migration may be possible for salmonids. This stream appears to be a tributary of the known fish-bearing creek located to the south east, crossed by the bridge to the south. No barriers to fish passage were identified downstream, so fish access to site is possible during high water. Electrofishing survey done downstream from crossing location, no fish caught or observed. Potentially fish-bearing seasonally.</p>				
Notes:		Cover	Fish Species	DV	Stream Class	Non-fish bearing
N/A Assessed but no data to report		SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing	
		LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m
		B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m
		UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel
		DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage
		OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.
		IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon		
				TSB Threespine stickleback		

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD109/ Bridge Site 44		Structure No.	
Watershed Code:	400-174068-42917		Stream Order	3		
Stream Name	Unnamed		Stream Class	S3		
Crew	HC,NN		UTM_Zone	09	UTM Northing	6031006
Survey Date	6/27/2016				UTM Easting	522663
Time	17:09:11		Site Length (m)	100		
Channel	Visible channel		Features	BR - Bridge		
Mean Channel Width (m)	2.33	Mean Wetted Width (m)	0.73	Mean Residual Pool Depth (m)		0.08
Mean Gradient (%)	4	Dominate Substrate	Gravels	Sub-dominate Substrate		Cobbles
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover		LWD, SWD
Water Quality	Temperature (Deg C)	13.4	pH	7.4	Conductivity (uS/cm)	224
					Turbidity	C-Clear
Riparian Vegetation			Crown Closure	71-90%		
Left Bank Shape	Undercut		Right Bank Shape	Sloping		
Left Bank Texture	Fines		Right Bank Texture	Fines		
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood		
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest		
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	Moderate - Gravels present but not abundant.					
Rearing	Poor - Little water present in isolated shallow pools.					
Overwintering	None - Will likely dry or freeze to bottom.					
Migration	Poor - Poor connectivity.					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	NFC		Species Stage-2016	N/A
Photo Comments						
Downstream extent of survey.						
Site Comments						
<p>Intermittent wetted areas, coarse gravels and cobbles, with fines. Diverse cover. Poor connectivity. Downstream of bridge perched culvert approx 200 m, 1 m drop on 1200 mm diameter at railway. No fish captured during sampling. Potential for fish presence in higher flows if barrier were removed.</p>						
Notes:	Cover	Fish Species	DV	Dolly varden	Stream Class	Fish bearing
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	Lamprey	S1 > 20 m	S5 > 3 m
	LWD Large woody debris	CC Sculpins	PK Pink salmon	Pink salmon	S2 > 5 m - 20 m	S6 < 3 m
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage
	DP Deep pools	CM Chum salmon	SA Salmon	Salmon		NCD and wetlands are non-fish bearing except where noted.
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon	Sockeye salmon		
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback	Threespine stickleback		



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD110 / Rd21R_3369			Structure No.	
Watershed Code:	400-174068-42917		Stream Order	N/A			
Stream Name	Unnamed		Stream Class	NVC			
Crew	DF, NN, IC, HC		UTM_Zone	09	UTM Northing	6030613	
Survey Date	6/27/2016				UTM Easting	522395	
Time	15:52:56		Site Length (m)	100			
Channel	No Visible Channel		Features	None			
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A	
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A	
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A	
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity
Riparian Vegetation			Crown Closure		N/A		
Left Bank Shape	N/A		Right Bank Shape		N/A		
Left Bank Texture	N/A		Right Bank Texture		N/A		
Left Bank Riparian Vegetation	N/A		Right Bank Riparian Vegetation		N/A		
Left Bank Stage	N/A		Right Bank Stage		N/A		
Habitat Comments	Fish Species	N/A					
Spawning	N/A						
Rearing	N/A						
Overwintering	N/A						
Migration	N/A						
Fish Information	Historical Fish Presence	No data					
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A	
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A	
Photo Comments							
Downstream extent of survey area.							
Site Comments			<p>No scour or alluvial deposition. Site is a dry depression with organics substrate. No defined banks. No fisheries potential.</p>				

Notes:	Cover	Fish Species	Stream Class
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback
			Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m
			Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD111 / Bridge Site 43	Structure No.	
Watershed Code:	400-174068-45826	Stream Order	2		
Stream Name	Unnamed	Stream Class	S3		
Crew	NN, IM	UTM_Zone	09	UTM Northing	6030070
Survey Date	5/9/2016			UTM Easting	522730
Time	17:30:39	Site Length (m)	100		
Channel	Visible channel	Features	BR - Bridge		
Mean Channel Width (m)	1.93	Mean Wetted Width (m)	1.00	Mean Residual Pool Depth (m)	0.14
Mean Gradient (%)	3	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels
In-stream Cover	Moderate	Dominant cover	OV	Sub-dominant cover	LWD, SWD


Water Quality	Temperature (Deg C)	8.2	pH	8.5	Conductivity (uS/cm)	51	Turbidity	C-Clear
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Riparian Vegetation		Crown Closure	41-70%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	Moderate - Moderate spawning for trout. Low water depths could limit access for spawners. Fines upstream of bridge so mainly downstream is where spawning habitat is located.	
Rearing	Moderate - Some cover elements beneficial for rearing trout including overhanging vegetation, small woody debris and large woody debris.	
Overwintering	None - No deep pools observed.	
Migration	Poor - Some migration is possible although water is shallow.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	CCT	Species Stage-2016	Parr

Photo Comments	Upstream view of bridge, showing the defined channel.
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Site Comments	<p>Diverse forest, species consisting of alder, hemlock, cedar, shrubs are Devils club, ferns. Overall channel comments: fairly diverse channel although shallow in places and lacking deep pools. Spawning habitat exists downstream of the bridge. Low flows at time of survey. Mature forest offers good shading and understory fills gaps in places.</p> 
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Notes:	Cover	Fish Species	Stream Class	
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD114 / Bridge Site 38		Structure No.	
Watershed Code:	400-174068-59390		Stream Order	1		
Stream Name	Unnamed		Stream Class	S5		
Crew	BH, IM		UTM_Zone	09	UTM Northing	6025902
Survey Date	6/26/2015				UTM Easting	521516
Time	14:24:31		Site Length (m)	100		
Channel	Visible Channel		Features	C- Cascade, CV - Culvert, BD - Beaver dam		
Mean Channel Width (m)	6.34	Mean Wetted Width (m)	2.65	Mean Residual Pool Depth (m)	0.11	
Mean Gradient (%)	11	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels	
In-stream Cover	Abundant	Dominant cover	IV	Sub-dominant cover	SWD, OV	
Water Quality	Temperature (Deg C)	14.8	pH	7.6	Conductivity (uS/cm)	59
					Turbidity	L-Lightly turbid
Riparian Vegetation			Crown Closure	21-40%		
Left Bank Shape	Sloping		Right Bank Shape	Sloping		
Left Bank Texture	Fines		Right Bank Texture	Fines		
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood		
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest		
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	Poor - None immediately above and below the road crossing but gravels do exist downstream, away from the influence of the crossing.					
Rearing	Poor - Low quality rearing habitat upstream and in the immediate vicinity of the crossing due to low flow depths and low cover levels.					
Overwintering	Poor - Limited deep pools consist of stagnant beaver pond upstream and shallow pools downstream.					
Migration	Poor - Bedrock cascades with low flow and high gradient. Barrier cascade prevents upstream migration.					
Fish Information	Historical Fish Presence	CCT, PK				
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	CCT		Species Stage-2016	Juvenile
Photo Comments						
Looking upstream from bottom of site.						
Site Comments			<p>There are two bedrock chute/cascades immediately downstream of the road crossing. Gradient in the chute is high (&gt;20%) and has two cascades each with a drop of approximately 2 m and is a barrier to upstream fish passage. Road crossing has been deactivated and one of the 2 culverts removed. Remaining culvert is high and dry and channel flows around it. Upstream of the road crossing, the habitat is very different. It is an old remnant pond created when the road was active. The culverts backed up the water and flooded the upstream channel. Now that the crossing is deactivated, the pond is gone and the habitat is dominated by fine sediments with vascular plants in a broad valley. Morphology downstream of TL10 is bedrock chute habitat for about 40 meters before flowing in a cobble gravel stream. Electrofishing and minnow trapping upstream habitat did not capture any fish. Electrofishing was conducted in the pool immediately below the barrier and a cutthroat trout was captured quickly. The stream is therefore rated as fish-bearing up to the barrier, but non-fish bearing at the crossing site and above.</p>			
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing		
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m	
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m	
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel	
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage	
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.	
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon			
			TSB Threespine stickleback			



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD115 / Site 13		Structure No.	
Watershed Code:	400-174068-59390		Stream Order	3		
Stream Name	Unnamed		Stream Class	S2		
Crew	IM, NN		UTM_Zone	09	UTM Northing	6022489
Survey Date	5/14/2016				UTM Easting	522145
Time	10:29:27		Site Length (m)	120		
Channel	Visible channel		Features	FSZ - Fisheries Sensitive Zone		
Mean Channel Width (m)	8.98	Mean Wetted Width (m)	7.16	Mean Residual Pool Depth (m)	0.46	
Mean Gradient (%)	2	Dominate Substrate	Gravels	Sub-dominate Substrate	Cobbles	
In-stream Cover	Abundant	Dominant cover	DP	Sub-dominant cover	LWD, OV, UC	
Water Quality	Temperature (Deg C)	6.7	pH	8.6	Conductivity (uS/cm)	19
					Turbidity	C-Clear
Riparian Vegetation			Crown Closure	21-40%		
Left Bank Shape	Undercut		Right Bank Shape	Sloping		
Left Bank Texture	Gravels		Right Bank Texture	Fines		
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood		
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest		
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	Excellent - Wide variety of gravel sizes, bars with cobbles, gravels abundant throughout stream. Downstream fisheries sensitive zone has pea gravels ideal for trout spawning.					
Rearing	Excellent - Abundant rearing habitat on channel margins, backwater side channels. Fisheries sensitive zone observed downstream providing rearing habitat. Wide variety of cover, pools of various depths abundant for different age classes. Many juvenile coho observed and netted in fisheries sensitive zone.					
Overwintering	Excellent - Deep pool habitat abundant. Observed 1+ age class coho meaning that overwintering must be available in the area.					
Migration	Excellent - No barrier, good for depths, deep pools for holding during migrations.					
Fish Information	Historical Fish Presence	n/a				
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	CO		Species Stage-2016	Fry
Photo Comments						
Upstream extent of the survey looking downstream back towards crossing location.						
Site Comments						
Channel is excellent fish habitat for all life stages and for all salmon and trout species. Abundant variety of habitat types: main cobble/gravel channel, side channels with pea gravels, tributary inlets, shallow riffles-run for spawning, deep pool for holding and rearing. Good large woody debris abundance to scour deep pools. Only signs of disturbance are channel constriction at bridge abutment and elevated mid-channel bars. There is a fisheries sensitive zone present approx 70 m downstream of bridge: stream runs against bedrock and turns 90 degrees to south. At this point, channel is braided and is joined by a tributary from the north. Abundant pools with pea gravels are present here with excellent spawning for trout and rearing for all juvenile species. No electrofishing was conducted done to avoid damaging potential redds. Dip netting in pools confirmed coho presence.						
Notes:	Cover	Fish Species	Stream Class			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	Fish bearing		Non-fish bearing
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m	
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m	
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel	
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage	
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.	
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon			
			TSB Threespine stickleback			

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD117	Structure No.	46			
Watershed Code:	400-174068-59390	Stream Order	2					
Stream Name	Unnamed	Stream Class	S3					
Crew	BH, IM	UTM_Zone	09	UTM Northing	6021931			
Survey Date	6/26/2015			UTM Easting	522974			
Time	10:50:16	Site Length (m)	100					
Channel	Visible Channel	Features	None					
Mean Channel Width (m)	3.48	Mean Wetted Width (m)	2.75	Mean Residual Pool Depth (m)	0.17			
Mean Gradient (%)	1	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels			
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	SWD, DP,UC			
Water Quality	Temperature (Deg C)	12.4	pH	7.5	Conductivity (uS/cm)	21	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	41-70%				
Left Bank Shape	Undercut		Right Bank Shape	Undercut				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Moderate - Low water depths currently limit gravel availability, gravels would likely be submerged at high flow. Likely good for cutthroat trout spawning.							
Rearing	Moderate - Good cover in pools but low flow.							
Overwintering	Poor - Shallow low flow pools. Likely low dissolved oxygen in stagnant pools.							
Migration	Poor - Poor for adult fish due to low flow.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Upstream from road crossing site looking upstream.							
Site Comments	Channel meanders significantly more than is marked on the FWA 20k map. Red algae present throughout site, coating channel substrates.							
Notes:	Cover	Fish Species	DV	Dolly varden	Stream Class			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey		Fish bearing			Non-fish bearing
	LWD Large woody debris	CC Sculpins	PK Pink salmon		S1 > 20 m			S5 > 3 m
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey		S2 > 5 m - 20 m			S6 < 3 m
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout		S3 1.5 m - 5 m			NVC No visible channel
	DP Deep pools	CM Chum salmon	SA Salmon		S4 < 1.5 m			NCD Non-classified drainage
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					NCD and wetlands are non-fish bearing except where noted.
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)


## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD118 / Lakelse FSR_69		Structure No.	
Watershed Code:	400-174068-59390		Stream Order	1		
Stream Name	Unnamed		Stream Class	S3		
Crew	DF, NN		UTM_Zone	09	UTM Northing	6021787
Survey Date	7/2/2016				UTM Easting	522413
Time	11:16:29		Site Length (m)	100		
Channel	Visible channel		Features	None		
Mean Channel Width (m)	2.09	Mean Wetted Width (m)	1.58	Mean Residual Pool Depth (m)		0.18
Mean Gradient (%)	5	Dominate Substrate	Gravels	Sub-dominate Substrate		Cobbles
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover		LWD, SWD, B, DP,UC
Water Quality	Temperature (Deg C)	11.0	pH	8.2	Conductivity (uS/cm)	42
					Turbidity	C-Clear
Riparian Vegetation			Crown Closure		>90%	
Left Bank Shape		Sloping	Right Bank Shape		Undercut	
Left Bank Texture		Fines	Right Bank Texture		Fines	
Left Bank Riparian Vegetation		Mixedwood	Right Bank Riparian Vegetation		Coniferous	
Left Bank Stage		Mature Forest	Right Bank Stage		Mature Forest	
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	Good - Pea-sized gravels suitable for trout spawning. Small channel size may limit salmon spawning although juvenile coho salmon captured upstream therefore coho spawners have likely passed the culvert to spawn.					
Rearing	Good - High cover and some deep residual pools.					
Overwintering	Moderate - Some deep pools upstream of the culvert. Plunge pool from culvert would provide overwintering habitat for juveniles.					
Migration	Good - Culvert at road crossing may create a partial barrier that could stop migration. Both juvenile coho and trout captured upstream and downstream of culvert.					
Fish Information	Historical Fish Presence		n/a			
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	CO, CCT		Species Stage-2016	Fry, Parr
Photo Comments						
Approximately 40 m downstream of culvert. Small pool with large undercut left bank						
Site Comments						
Open canopy upstream of culvert causes thick understory growth of Devils club, salmon berry and huckleberry that completely covers channel. Further upstream the channel opens up and cover is primarily provided by large woody debris. Downstream of culvert, less overhanging vegetation however abundant undercut banks provide cover. Hanging culvert and plunge pool at crossing.						
Notes:	Cover	Fish Species	Stream Class			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	Fish bearing		Non-fish bearing
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m	
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m	
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel	
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage	
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.	
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon			
			TSB Threespine stickleback			



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog


Prepared for BC Hydro


Project No VE52379


Date 28-Oct-16




Crossing Type	Access Road	Site Number	RD119	Structure No.	67			
Watershed Code:	910-665062-30171	Stream Order	N/A					
Stream Name	Unnamed	Stream Class	NVC					
Crew	BH, IM	UTM_Zone	09	UTM Northing	6015677			
Survey Date	6/25/2015			UTM Easting	523593			
Time	13:39:26	Site Length (m)	100					
Channel	No Visible Channel	Features	None					
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A			
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A			
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A			
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation			Crown Closure	N/A				
Left Bank Shape	N/A	Right Bank Shape	N/A					
Left Bank Texture	N/A	Right Bank Texture	N/A					
Left Bank Riparian Vegetation	N/A	Right Bank Riparian Vegetation	N/A					
Left Bank Stage	N/A	Right Bank Stage	N/A					
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments								
Thick vegetation, no watercourse.								
Site Comments								
No channel present. No culvert present.								
Notes:	Cover	Fish Species	Stream Class	Non-fish bearing				
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					


<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	


Crossing Type	Access Road	Site Number	RD122		Structure No.	
Watershed Code:	910-665062-30171		Stream Order	N/A		
Stream Name	Unnamed		Stream Class	NVC		
Crew	NN, DF		UTM_Zone	09	UTM Northing	6014909
Survey Date	7/5/2016				UTM Easting	523857
Time	11:00:57		Site Length (m)	100		
Channel	No Visible Channel		Features	None		
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A
					Turbidity	N/A
Riparian Vegetation			Crown Closure		N/A	
Left Bank Shape		N/A	Right Bank Shape		N/A	
Left Bank Texture		N/A	Right Bank Texture		N/A	
Left Bank Riparian Vegetation		N/A	Right Bank Riparian Vegetation		N/A	
Left Bank Stage		N/A	Right Bank Stage		N/A	
Habitat Comments	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
Photo Comments						
Upstream view of NVC.						
Site Comments						
No scour or channel. Dry depression. Some alder shrubs. Looks to be an old trail.						
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	<u>Fish bearing</u>		
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S5 > 3 m	
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	S6 < 3 m	
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NVC No visible channel	
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD Non-classified drainage	
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon		NCD and wetlands are non-fish bearing except where noted.	
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback			


<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	



Crossing Type	Access Road	Site Number	RD124		Structure No.	
Watershed Code:	910-665062-20282		Stream Order	1		
Stream Name	Unnamed		Stream Class	S5		
Crew	BH, IM		UTM_Zone	09	UTM Northing	6013195
Survey Date	6/25/2015				UTM Easting	522872
Time	09:14:21		Site Length (m)	100		
Channel	Visible Channel		Features	BG - Crossing, general		
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)		No data
Mean Gradient (%)	No data	Dominate Substrate	Fines	Sub-dominate Substrate		Fines
In-stream Cover	Abundant	Dominant cover	DP	Sub-dominant cover		IV
Water Quality	Temperature (Deg C)	18.6	pH	7.0	Conductivity (uS/cm)	22
					Turbidity	L-Lightly turbid
Riparian Vegetation			Crown Closure	0		
Left Bank Shape	Sloping		Right Bank Shape	Sloping		
Left Bank Texture	Fines		Right Bank Texture	Fines		
Left Bank Riparian Vegetation	Wetland		Right Bank Riparian Vegetation	Wetland		
Left Bank Stage	Shrub/Herb		Right Bank Stage	Shrub/Herb		
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	None - Bog, no flows, all peat substrates.					
Rearing	None - Bog, no flows, all peat substrates					
Overwintering	None - Likely low dissolved oxygen, no flows.					
Migration	None - Bog, no flows, all peat substrates, road is likely barrier, bog downstream is likely not fish habitat.					
Fish Information	Historical Fish Presence	No data				
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	NFC		Species Stage-2016	N/A
<b>Photo Comments</b> Downstream extent of survey looking at wet bog area.						
<b>Site Comments</b> Bog habitat, sphagnum moss throughout, deep peat. Approx 80 m wide bog. No fish habitat, no fish access, no fish captured. Lab tea, sphagnum moss, sundews, water lily, bog cranberry, dwarfed cedars and hemlock, sedge patches.						
Notes:	Cover	Fish Species		Stream Class		
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<b>Fish bearing</b> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<b>Non-fish bearing</b> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.	



<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	RD133 / 1064 BR_2926		Structure No.	
Watershed Code:	910-665062-20282		Stream Order	1		
Stream Name	Unnamed		Stream Class	S6		
Crew	HC, IM, JS		UTM_Zone	09	UTM Northing	6009414
Survey Date	6/30/2016				UTM Easting	522083
Time	16:37:40		Site Length (m)	100		
Channel	Visible channel		Features	None		
Mean Channel Width (m)	0.98	Mean Wetted Width (m)	0.67	Mean Residual Pool Depth (m)		0.16
Mean Gradient (%)	4	Dominate Substrate	Fines	Sub-dominate Substrate		Gravels
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover		LWD, SWD
Water Quality	Temperature (Deg C)	13.1	pH	7.9	Conductivity (uS/cm)	17
					Turbidity	C-Clear
Riparian Vegetation			Crown Closure		71-90%	
Left Bank Shape		Sloping	Right Bank Shape		Undercut	
Left Bank Texture		Fines	Right Bank Texture		Fines	
Left Bank Riparian Vegetation		Mixedwood	Right Bank Riparian Vegetation		Mixedwood	
Left Bank Stage		Mature Forest	Right Bank Stage		Mature Forest	
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	None - Coarse substrates observed only observed on road overflow channel and immediately below road. Fines dominant.					
Rearing	Poor - Some shallow areas present with abundant cover provided by overhanging vegetation and woody debris.					
Overwintering	None - Lack of depth, with exception of wetland habitat upstream of road which would only be accessible to fish during extreme high water events.					
Migration	Poor - At current flows migration would be restricted to rearing fish species.					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	NFC		Species Stage-2016	N/A
Photo Comments						
Downstream extent of survey.						
Site Comments						
<p>Impounded open water wetland habitat upstream of crossing location approx 10 m wide with depths greater than 1 m. Dry overflow channel present on road. Small amount of flow making path through road, potentially in buried culvert. Downstream of crossing areas of defined channel alternate with a braided non defined channel with minimal flow. Coarse substes are only associated with the road. No barriers to fish passage were observed up to 300m downstream and no obvious terrain barriers however at current flow levels migration would be limited to rearing fish. No fish captured or observed.</p>						
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	<u>Fish bearing</u>		
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S5 > 3 m	
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	S6 < 3 m	
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NVC No visible channel	
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD Non-classified drainage	
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon		NCD and wetlands are non-fish bearing except where noted.	
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback			

<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	Rd135R-321		Structure No.			
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	S6					
Crew	HC, IM, WM	UTM_Zone	09	UTM Northing	5995713			
Survey Date	7/5/2016			UTM Easting	520864			
Time	16:44:53	Site Length (m)	100					
Channel	Visible channel		Features	FSB - Subsurface flow				
Mean Channel Width (m)	1.30	Mean Wetted Width (m)	1.00	Mean Residual Pool Depth (m)	0.12			
Mean Gradient (%)	2	Dominate Substrate	Fines	Sub-dominate Substrate	Fines			
In-stream Cover	Moderate	Dominant cover	SWD, OV	Sub-dominant cover	N/A			
Water Quality	Temperature (Deg C)	11.1	pH	6.7	Conductivity (uS/cm)	37	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	71-90%				
Left Bank Shape	Sloping		Right Bank Shape	Undercut				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Coniferous		Right Bank Riparian Vegetation	Coniferous				
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - Only organic substrates present for 100 m downstream and upstream of crossing, barrier preventing access.							
Rearing	None - See spawning comments.							
Overwintering	None - See spawning comments.							
Migration	None - See spawning comments.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Yes	Species Captured-2016	NFC		Species Stage-2016	N/A		
Photo Comments								
Facing downstream from the crossing site, showing a small section of defined channel.								
Site Comments								
<p>Approximately 50 m upstream of road the channel loses definition and becomes a series of intermittent pools in a wetland area with ferns, sedges and hardhack. Culvert inlet is not where channel meets road, flow appears to currently be subsurface at road. Organics and fine sediment substrates with no coarse material observed for 100 m downstream of crossing. At 100 m downstream, an old road barrier is present, with only subsurface flow seeping through. Downstream of this barrier substrates are gravels cobbles and fines for 60 m then the drainage broadens into a wetland habitat with organic substrates and no defined channel. No access for fish through downstream barrier. No fish captured during electrofishing upstream or downstream of road barrier.</p>								
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD138	Structure No.	
Watershed Code:	910-665062-20282	Stream Order	1		
Stream Name	Unnamed	Stream Class	S6		
Crew	BH, IM	UTM_Zone	09	UTM Northing	6008350
Survey Date	6/23/2015			UTM Easting	521477
Time	16:24:35	Site Length (m)	100		
Channel	Visible Channel	Features	None		
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)	No data
Mean Gradient (%)	25	Dominate Substrate	No data	Sub-dominate Substrate	No data
In-stream Cover	No data	Dominant cover	No data	Sub-dominant cover	No data
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)
					No data
					Turbidity
					No data
Riparian Vegetation		Crown Closure		No data	
Left Bank Shape	No data	Right Bank Shape		No data	
Left Bank Texture	No data	Right Bank Texture		No data	
Left Bank Riparian Vegetation	No data	Right Bank Riparian Vegetation		No data	
Left Bank Stage	No data	Right Bank Stage		No data	
Habitat Comments	Fish Species	AO - All Salmonids			
Spawning	None - Too steep with too little flow to support fish.				
Rearing	None - Too steep with too little flow to support fish.				
Overwintering	None - Too steep with too little flow to support fish.				
Migration	None - Too steep with too little flow to support fish.				
Fish Information	Historical Fish Presence	No data			
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A
Photo Comments	Seep at foot path.				
Site Comments	Stream is a groundwater seep flowing in a very poorly defined channel. Mostly it flows overland and pools in depressions. Abundant red algae in channel. Steep (25%) slope at site.				
Notes:	Cover	Fish Species	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	Fish bearing	
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon		
			TSB Threespine stickleback		



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog


Prepared for BC Hydro


Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD140	Structure No.	
Watershed Code:	No data	Stream Order	1		
Stream Name	Unnamed	Stream Class	S5		
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6005920
Survey Date	6/30/2016			UTM Easting	521104
Time	12:28:37	Site Length (m)	300		
Channel	Other	Features	None		
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)	No data
Mean Gradient (%)	30	Dominate Substrate	No data	Sub-dominate Substrate	No data
In-stream Cover	No data	Dominant cover	No data	Sub-dominant cover	No data
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)
					No data
					Turbidity
					C-Clear
Riparian Vegetation		Crown Closure	No data		
Left Bank Shape	No data	Right Bank Shape	No data		
Left Bank Texture	No data	Right Bank Texture	No data		
Left Bank Riparian Vegetation	No data	Right Bank Riparian Vegetation	No data		
Left Bank Stage	No data	Right Bank Stage	No data		
Habitat Comments	Fish Species	N/A			
Spawning	N/A				
Rearing	N/A				
Overwintering	N/A				
Migration	N/A				
Fish Information	Historical Fish Presence	No data			
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A
Photo Comments	Barrier falls and steep cascade section.				
Site Comments	<p>Assessment done at barrier site downstream of crossing site, so no channel dimensions for the actual crossing site are available. Barrier site is long (60 m) cascade pool section, with several small falls. Channel is narrow boulder bedrock chute, with an average 30% gradient. Short ~5 m sections with gradient of &gt;50%. Falls at upstream end is 0.9 m tall, with a 0.1 m plunge pool. Not passable by juveniles or adults at any conditions. No plunge pool for adults to jump barrier falls. Juveniles not able to jump this height. Cascades section downstream is also too steep and shallow for passage. No fish potential at crossing site.</p>				
Notes:	Cover	Fish Species	Stream Class		
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.

Terrace to Kitimat Transmission Project (TKTP)										Prepared for BC Hydro		
Freshwater Fish and Fish Habitat Catalog										Project No	VE52379	
										Date	28-Oct-16	

Crossing Type	Access Road	Site Number	Rd145R_2900				Structure No.	
Watershed Code:	No data		Stream Order	2				
Stream Name	Unnamed		Stream Class	S4				
Crew	IM, HC, WM		UTM_Zone	09	UTM Northing	5995502		
Survey Date	7/5/2016				UTM Easting	520149		
Time	11:12:50		Site Length (m)	100				
Channel	Visible channel		Features	None				
Mean Channel Width (m)	1.09	Mean Wetted Width (m)	0.79	Mean Residual Pool Depth (m)		0.14		
Mean Gradient (%)	3	Dominate Substrate	Fines	Sub-dominate Substrate		Gravels		
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover		SWD,IV		
Water Quality	Temperature (Deg C)	11.1	pH	8.1	Conductivity (uS/cm)	163	Turbidity	C-Clear
Riparian Vegetation			Crown Closure		21-40%			
Left Bank Shape		Sloping		Right Bank Shape		Sloping		
Left Bank Texture		Fines		Right Bank Texture		Fines		
Left Bank Riparian Vegetation		Mixedwood		Right Bank Riparian Vegetation		Mixedwood		
Left Bank Stage		Young Forest		Right Bank Stage		Young Forest		
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Poor - Small patches of pea-sized gravel present, but limited by abundant fines throughout.							
Rearing	Moderate - Good cover availability, some pool habitat available for cover.							
Overwintering	Poor - No deep pools, possibly low water and dissolved oxygen during winter.							
Migration	Moderate - No barriers observed, but wetland habitat present downstream that may limit salmonid access.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Yes	Species Captured-2016	PL		Species Stage-2016	Juvenile		
Photo Comments								
Channel 20 m upstream of crossing site.								
Site Comments			<p>Stream at crossing site consists of a defined channel, tortuously meandering through a broad valley bottom. Channel is dominated by fines, with some small patches of gravels or cobbles. Channel banks and valley bottom is dominated by shrubs: ferns, salmon berry, Devils club. Channel is joined by a tributary approx 25 m upstream. Flow rate and volume is approximately doubled by the tributary. Crossing site appears to be a wood culvert that is passing water, but with no visible passage under the road. Habitat is generally moderate for salmonid rearing and migration, and poor to nil for spawning and overwintering. Lamprey ammocoete captured 30 m downstream of crossing. Fish access to site demonstrated by lamprey presence.</p>					
Notes:	Cover	Fish Species	DV	Dolly varden	Stream Class	Non-fish bearing		
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey		<u>Fish bearing</u>			
	LWD Large woody debris	CC Sculpins	PK Pink salmon		S1 > 20 m	S5 > 3 m		
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey		S2 > 5 m - 20 m	S6 < 3 m		
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout		S3 1.5 m - 5 m	NVC No visible channel		
	DP Deep pools	CM Chum salmon	SA Salmon		S4 < 1.5 m	NCD Non-classified drainage		
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon			NCD and wetlands are non-fish bearing except where noted.		
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD145R-2896 / Site 49	Structure No.	
Watershed Code:	No data	Stream Order	3		
Stream Name	Unnamed	Stream Class	S4		
Crew	IM, HC, WM	UTM_Zone	09	UTM Northing	5995531
Survey Date	7/5/2016			UTM Easting	520175
Time	12:56:27	Site Length (m)	100		
Channel	Visible channel	Features	None		
Mean Channel Width (m)	1.47	Mean Wetted Width (m)	1.06	Mean Residual Pool Depth (m)	0.19
Mean Gradient (%)	4	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels
In-stream Cover	Moderate	Dominant cover	OV	Sub-dominant cover	LWD, SWD

Water Quality	Temperature (Deg C)	12.2	pH	7.8	Conductivity (uS/cm)	64	Turbidity	C-Clear
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Riparian Vegetation		Crown Closure	71-90%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Coniferous	Right Bank Riparian Vegetation	Deciduous
Left Bank Stage	Young Forest	Right Bank Stage	Pole/Sapling

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	Poor - Small sections of small pea gravels downstream of road.	
Rearing	Moderate - Cover provided by woody debris and overhanging vegetation.	
Overwintering	Poor - Lack of deep pool habitat, and low flows during survey.	
Migration	Moderate - No barriers observed downstream of road. Road itself is likely a barrier to migrating fish further upstream.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	DV	Species Stage-2016	Fry

Photo Comments	
Taken about 30 m upstream of culvert.	

Site Comments	
Immediately upstream of road, habitat is impounded by blocked or collapsed culvert and water appears to be draining through road material. Organic substrates and fines are dominant with some small sections of pea gravels downstream of road crossing. Approx. 30 m downstream of crossing, defined channel is broken into several channels and spreads laterally in widened valley. Dolly Varden captured downstream of road during electrofishing effort. Road appears to be a barrier as flow through is subsurface, however no electrofishing was completed upstream due to poor substrates and channel conditions.	



Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Rd147_348		Structure No.	
Watershed Code:	No data	Stream Order	1			
Stream Name	Unnamed	Stream Class	S4			
Crew	DF, NN	UTM_Zone	09	UTM Northing	5993697	
Survey Date	7/7/2016			UTM Easting	519580	
Time	11:01:39	Site Length (m)	100			
Channel	Visible channel		Features	None		
Mean Channel Width (m)	1.29	Mean Wetted Width (m)	1.02	Mean Residual Pool Depth (m)	0.09	
Mean Gradient (%)	2	Dominate Substrate	Fines	Sub-dominate Substrate	Fines	
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	SWD,IV, UC	
Water Quality	Temperature (Deg C)	11.6	pH	8.2	Conductivity (uS/cm)	295
					Turbidity	C-Clear
Riparian Vegetation			Crown Closure	41-70%		
Left Bank Shape	Sloping		Right Bank Shape	Undercut		
Left Bank Texture	Fines		Right Bank Texture	Fines		
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood		
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest		
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	None - No gravels and very small channel size.					
Rearing	Poor - Abundant cover but limited pool habitat. Upstream section of study area is non-classified drainage limiting habitat to site crossing and downstream.					
Overwintering	Poor - Limited pool habitat. Fish passage may be impeded at times of the year due to low flows.					
Migration	Poor - Some sections have subterranean flow however overland flow likely during other the wet season. Drop of 0.5m within the survey area may create a barrier to juveniles during low flow seasons.					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	NFC		Species Stage-2016	N/A
<b>Photo Comments</b> At the downstream extent of study area where channel is well defined.						
<b>Site Comments</b> From the centre line the watercourse flows in a defined channel downstream through wetland and coniferous vegetation. Creek is shallow and pool habitat is rare. Some sections of subsurface flow and drops (~0.5 m) may impede fish movements. Upstream of the centre line the watercourse becomes non-classified drainage. All measurements were taken in the channelized section. Bed materials are fine materials throughout study area. No coarse substrate. No fish captured. Creek changes to non-classified drainage only 5 m up of crossing, and poor channel conditions/some subsurface sections.						
Notes:	Cover	Fish Species	DV	Dolly varden	Stream Class	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey		Fish bearing	Non-fish bearing
	LWD Large woody debris	CC Sculpins	PK Pink salmon		S1 > 20 m	S5 > 3 m
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey		S2 > 5 m - 20 m	S6 < 3 m
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout		S3 1.5 m - 5 m	NVC No visible channel
	DP Deep pools	CM Chum salmon	SA Salmon		S4 < 1.5 m	NCD Non-classified drainage
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon			NCD and wetlands are non-fish bearing except where noted.
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback			

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD155	Structure No.	
Watershed Code:	910-665062-20282	Stream Order	1		
Stream Name	Unnamed	Stream Class	S6		
Crew	IM, HC, WM	UTM_Zone	09	UTM Northing	5995839
Survey Date	7/5/2016			UTM Easting	520098
Time	14:37:56	Site Length (m)	100		
Channel	Visible channel	Features	None		
Mean Channel Width (m)	2.59	Mean Wetted Width (m)	2.11	Mean Residual Pool Depth (m)	0.15
Mean Gradient (%)	15	Dominate Substrate	Gravels	Sub-dominate Substrate	Cobbles
In-stream Cover	Abundant	Dominant cover	LWD	Sub-dominant cover	SWD, OV
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)
					No data
					Turbidity
					C-Clear
Riparian Vegetation		Crown Closure	41-70%		
Left Bank Shape	Sloping	Right Bank Shape	Sloping		
Left Bank Texture	Gravels	Right Bank Texture	Gravels		
Left Bank Riparian Vegetation	Coniferous	Right Bank Riparian Vegetation	Coniferous		
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest		
Habitat Comments	Fish Species	AO - All Salmonids			
Spawning	None - No spawning, no fish access to site.				
Rearing	None - No potential for fish access to site.				
Overwintering	None - No potential for fish access to site.				
Migration	None - No potential for fish access to site.				
Fish Information	Historical Fish Presence	No data			
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	NFC	Species Stage-2016	N/A
Photo Comments	Upstream extent of survey.				
Site Comments	Stream is very nice, well defined channel. However, barrier to fish passage was identified downstream. Fishing done at crossing sites and immediately upstream of barrier, no fish captured. Fishing for 55 seconds below barrier captured 2 coastal cutthroat trout parr. No fish access above barrier site. Crossing sites upstream are non-fish bearing.				
Notes:	Cover	Fish Species	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	Fish bearing	
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon		
			TSB Threespine stickleback		

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD157	Structure No.				
Watershed Code:	910-665062-09749	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	IM, NN, LS	UTM_Zone	09	UTM Northing	5995742			
Survey Date	6/20/2015			UTM Easting	520618			
Time	15:16:05	Site Length (m)	100					
Channel	Visible Channel	Features	None					
Mean Channel Width (m)	1.68	Mean Wetted Width (m)	1.42	Mean Residual Pool Depth (m)	0.25			
Mean Gradient (%)	2	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels			
In-stream Cover	Abundant	Dominant cover	SWD	Sub-dominant cover	LWD, DP, IV, OV			
Water Quality	Temperature (Deg C)	13.1	pH	8.3	Conductivity (uS/cm)	17	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	41-70%				
Left Bank Shape	Sloping		Right Bank Shape	Sloping				
Left Bank Texture	Gravels		Right Bank Texture	Gravels				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No gravel patches of sufficient size to support spawning.							
Rearing	Moderate - Moderate trout rearing, no salmon. Low flow depths.							
Overwintering	Poor - Beaver dams provide deep pools, although low flows are likely low in dissolved oxygen during winter.							
Migration	Poor - Beaver dams likely make migration difficult. Likely only passable by small bodied fish.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Yes	Species Captured-2015	NFC	Species Stage-2015	N/A			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Upstream of crossing.							
Site Comments	1 m diameter wooden open bottom culvert. 8 m culvert length. Moderate trout rearing, although none captured. Beaver dams throughout reach, possible barriers or barriers downstream. Poor migration, no spawning, poor overwintering due to low flows and low oxygen in beaver ponds.							
Notes:	Cover	Fish Species	Stream Class	Fish bearing	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	S1 > 20 m	S5 > 3 m			
	LWD Large woody debris	CC Sculpins	L Lamprey	S2 > 5 m - 20 m	S6 < 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S3 1.5 m - 5 m	NVC No visible channel			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S4 < 1.5 m	NCD Non-classified drainage			
	DP Deep pools	CM Chum salmon	RB Rainbow trout		NCD and wetlands are non-fish			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD158	Structure No.	
Watershed Code:	910-665062-09749	Stream Order	1		
Stream Name	Unnamed	Stream Class	S2		
Crew	IM, NN, LS	UTM_Zone	09	UTM Northing	5995746
Survey Date	6/20/2015			UTM Easting	520432
Time	13:39:19	Site Length (m)	100		
Channel	Visible Channel	Features	BD - Beaver dam		
Mean Channel Width (m)	6.21	Mean Wetted Width (m)	5.68	Mean Residual Pool Depth (m)	0.13
Mean Gradient (%)	1	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels
In-stream Cover	Moderate	Dominant cover	SWD	Sub-dominant cover	IV, OV

Water Quality	Temperature (Deg C)	8.9	pH	8.1	Conductivity (uS/cm)	177	Turbidity	C-Clear
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Riparian Vegetation		Crown Closure	1-20%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest


Habitat Comments	Fish Species	AO - All Salmonids
Spawning	Poor - Some pea-sized gravels for rainbow trout.	
Rearing	Moderate - Moderate rearing habitat for small trout or salmon.	
Overwintering	None - No deep pools available for trout overwintering.	
Migration	Poor - Beaver dams downstream of crossing site limit migration potential.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Yes	Species Captured-2015	RB	Species Stage-2015	Fry
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments	
Downstream view of beaver pond.	
Site Comments	Stream provides primarily rearing habitat for juvenile trout.

Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	Fish bearing	S5 > 3 m
	LWD Large woody debris	CC Sculpins	S1 > 20 m	S6 < 3 m
	B Boulder	CCT Coastal cutthroat trout	S2 > 5 m - 20 m	NVC No visible channel
	UC Undercut bank	CH Chinook salmon	S3 1.5 m - 5 m	NCD Non-classified drainage
	DP Deep pools	CM Chum salmon	S4 < 1.5 m	NCD and wetlands are non-fish bearing except where noted.
	OV Overhanging vegetation	CO Coho salmon		
	IV Instream vegetation	CCG Slimy sculpin		
		DV Dolly varden		
		L Lamprey		
		PK Pink salmon		
		PL Pacific Lamprey		
		RB Rainbow trout		
		SA Salmon		
		SK Sockeye salmon		
		TSB Threespine stickleback		

<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	RD159		Structure No.	
Watershed Code:	910-665062-09749		Stream Order	2		
Stream Name	Unnamed		Stream Class	S3		
Crew	IM, NN		UTM_Zone	09	UTM Northing	5995720
Survey Date	6/21/2015				UTM Easting	520969
Time	09:36:57		Site Length (m)	100		
Channel	Visible Channel		Features	None		
Mean Channel Width (m)	3.48	Mean Wetted Width (m)	2.40	Mean Residual Pool Depth (m)		0.28
Mean Gradient (%)	1	Dominate Substrate	Gravels	Sub-dominate Substrate		Fines
In-stream Cover	Moderate	Dominant cover	LWD	Sub-dominant cover		SWD, OV, UC
Water Quality	Temperature (Deg C)	8.1	pH	8.3	Conductivity (uS/cm)	45
					Turbidity	C-Clear
Riparian Vegetation			Crown Closure		41-70%	
Left Bank Shape		Undercut	Right Bank Shape		Undercut	
Left Bank Texture		Gravels	Right Bank Texture		Gravels	
Left Bank Riparian Vegetation		Mixedwood	Right Bank Riparian Vegetation		Mixedwood	
Left Bank Stage		Young Forest	Right Bank Stage		Young Forest	
Habitat Comments	Fish Species	AO - All Salmonids				
Spawning	Excellent - Abundant spawning for trout, possible use by small salmon.					
Rearing	Excellent - Abundant cover and habitat variety for trout and salmon fry and parr.					
Overwintering	Moderate - Deep pools present, but not abundant.					
Migration	Excellent - Water depths are sufficient for trout, larger salmon may not be able to access due to flow depths in shallow sections.					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Yes	Species Captured-2015	RB	Species Stage-2015	Parr	
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A	
Photo Comments						
Pool located downstream from crossing site.						
Site Comments						
<p>Excellent habitat for trout and small salmon, good habitat variety, diverse channel. Good undercut and large woody debris cover. Recommend clear span bridge crossing, not culvert. Good habitat directly under crossing site.</p>						
Notes:	Cover	Fish Species	Stream Class		Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.	

# Terrace to Kitimat Transmission Project (TKTP)


## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD161	Structure No.				
Watershed Code:	910-665062-09749	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	IM, NN	UTM_Zone	09	UTM Northing	5994544			
Survey Date	6/19/2015			UTM Easting	519482			
Time	12:28:07	Site Length (m)	100					
Channel	Visible Channel	Features	None					
Mean Channel Width (m)	1.74	Mean Wetted Width (m)	0.98	Mean Residual Pool Depth (m)	0.14			
Mean Gradient (%)	17	Dominate Substrate	Gravels	Sub-dominate Substrate	Cobbles			
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	LWD, SWD			
Water Quality	Temperature (Deg C)	9.4	pH	8.1	Conductivity (uS/cm)	222	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	21-40%				
Left Bank Shape	Sloping		Right Bank Shape	Sloping				
Left Bank Texture	Gravels		Right Bank Texture	Gravels				
Left Bank Riparian Vegetation	Coniferous		Right Bank Riparian Vegetation	Coniferous				
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - Very few riffle-pool areas with gravel for spawning.							
Rearing	Moderate - Trout rearing habitat, likely no salmon access due to small size and low flows. Good cover and some deep pools for rearing.							
Overwintering	Poor - Trout minimal overwintering in deep pools.							
Migration	Poor - Trout migration from only, no depth for salmon.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Yes	Species Captured-2015	RB	Species Stage-2015	Parr			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Downstream extent of the survey.							
Site Comments	Moderate quality habitat for young trout. Some pools offer good cover with undercuts woody debris and overhanging vegetation. Some steps down to pools, poor migration potential at time of survey.							
								
Notes:	Cover	Fish Species	DV	Stream Class	Fish bearing	Non-fish bearing		
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	S1 > 20 m	S5 > 3 m			
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	DP Deep pools	CM Chum salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD162	Structure No.	
Watershed Code:	910-665062-09749	Stream Order	1		
Stream Name	Unnamed	Stream Class	S5		
Crew	IM, NN	UTM_Zone	09	UTM Northing	5993986
Survey Date	6/19/2015			UTM Easting	519571
Time	14:30:35	Site Length (m)	100		
Channel	Visible Channel	Features	None		
Mean Channel Width (m)	3.46	Mean Wetted Width (m)	2.94	Mean Residual Pool Depth (m)	1.35
Mean Gradient (%)	5	Dominate Substrate	Cobbles	Sub-dominate Substrate	Gravels
In-stream Cover	Abundant	Dominant cover	SWD	Sub-dominant cover	LWD, OV

Water Quality	Temperature (Deg C)	10.0	pH	8.1	Conductivity (uS/cm)	81	Turbidity	C-Clear
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Riparian Vegetation		Crown Closure	71-90%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Gravels	Right Bank Texture	Gravels
Left Bank Riparian Vegetation	Coniferous	Right Bank Riparian Vegetation	Coniferous
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	None - No spawning, no fish access to site.	
Rearing	None - No potential for fish access to site.	
Overwintering	None - No potential for fish access to site.	
Migration	None - No potential for fish access to site.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Yes	Species Captured-2015	NFC	Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	NFC	Species Stage-2016	N/A

Photo Comments	
No culvert observed.	

Site Comments	
Large pools on both sides of road with no fish present. No evidence of culvert. Suspect that old wooden culvert may have collapsed. Barrier found to fish passage downstream of site. Series of steep cascades and falls. Section is approx. 16 m long with large elevation drop, estimated to be 10 m. No fish passage possible up cascades. Juvenile coastal cutthroat trout captured downstream of cascades.	



Notes:	Cover	Fish Species	Stream Class	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	Fish bearing	Non-fish bearing
	LWD Large woody debris	CC Sculpins	S1 > 20 m	S5 > 3 m
	B Boulder	CCT Coastal cutthroat trout	S2 > 5 m - 20 m	S6 < 3 m
	UC Undercut bank	CH Chinook salmon	S3 1.5 m - 5 m	NVC No visible channel
	DP Deep pools	CM Chum salmon	S4 < 1.5 m	NCD Non-classified drainage
	OV Overhanging vegetation	CO Coho salmon		NCD and wetlands are non-fish bearing except where noted.
	IV Instream vegetation	CCG Slimy sculpin		
		DV Dolly varden		
		L Lamprey		
		PK Pink salmon		
		PL Pacific Lamprey		
		RB Rainbow trout		
		SA Salmon		
		SK Sockeye salmon		
		TSB Threespine stickleback		

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD163	Structure No.				
Watershed Code:	910-665062-09749	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	IM, NN	UTM_Zone	09	UTM Northing	5992999			
Survey Date	6/19/2015			UTM Easting	519559			
Time	16:53:53	Site Length (m)	100					
Channel	Visible Channel	Features	None					
Mean Channel Width (m)	1.68	Mean Wetted Width (m)	1.21	Mean Residual Pool Depth (m)	0.15			
Mean Gradient (%)	16	Dominate Substrate	Cobbles	Sub-dominate Substrate	Gravels			
In-stream Cover	Moderate	Dominant cover	B	Sub-dominant cover	LWD, SWD, OV, UC			
Water Quality	Temperature (Deg C)	10.5	pH	7.9	Conductivity (uS/cm)	117	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	41-70%				
Left Bank Shape	Sloping		Right Bank Shape	Sloping				
Left Bank Texture	Gravels		Right Bank Texture	Gravels				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No adequate gravel.							
Rearing	Moderate - Pool rearing habitat for juvenile trout is available but does not have much depth or area. Good variety of other cover types available.							
Overwintering	Poor - Possible overwintering for juvenile trout in shallow pools. Low flows and ice may prevent overwintering in most areas.							
Migration	Poor - Poor migration for trout, none for salmon, step pools present with low flow depth.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Yes	Species Captured-2015	RB	Species Stage-2015	Parr			
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Looking upstream from the crossing site.							
Site Comments	Moderate rearing for small juvenile trout. Pools support trout with good cover. Large bodied fish habitat is absent. Step pool morphology throughout with low flows.							
Notes:	Cover	Fish Species	DV	Stream Class	Fish bearing	Non-fish bearing		
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	S1 > 20 m	S5 > 3 m			
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	DP Deep pools	CM Chum salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD164	Structure No.				
Watershed Code:	910-665062-09749	Stream Order	N/A					
Stream Name	Unnamed	Stream Class	NVC					
Crew	IM, NN, CW	UTM_Zone	09	UTM Northing	5992733			
Survey Date	6/18/2015			UTM Easting	519438			
Time	12:42:39	Site Length (m)	100					
Channel	No Visible Channel	Features	None					
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A			
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A			
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A			
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation					Crown Closure	N/A		
Left Bank Shape	N/A				Right Bank Shape	N/A		
Left Bank Texture	N/A				Right Bank Texture	N/A		
Left Bank Riparian Vegetation	N/A				Right Bank Riparian Vegetation	N/A		
Left Bank Stage	N/A				Right Bank Stage	N/A		
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Not visited	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments	Upstream of site. Upstream of existing road (RD165).							
Site Comments	No visible channel upstream of road. Small pool upstream of road, no flowing water. Mud and vegetation including skunk cabbage.							
Notes:	Cover	Fish Species	DV	Dolly varden	Stream Class	Fish bearing	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey		S1 > 20 m	S5 > 3 m		
	LWD Large woody debris	CC Sculpins	PK Pink salmon		S2 > 5 m - 20 m	S6 < 3 m		
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey		S3 1.5 m - 5 m	NVC No visible channel		
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout		S4 < 1.5 m	NCD Non-classified drainage		
	DP Deep pools	CM Chum salmon	SA Salmon			NCD and wetlands are non-fish bearing except where noted.		
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD165	Structure No.				
Watershed Code:	910-665062-09749	Stream Order	N/A					
Stream Name	Unnamed	Stream Class	NVC					
Crew	IM, NN, CW	UTM_Zone	09	UTM Northing	5992733			
Survey Date	6/18/2015			UTM Easting	519438			
Time	12:42:39	Site Length (m)	100					
Channel	No Visible Channel	Features	None					
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A			
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A			
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A			
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation		Crown Closure		N/A				
Left Bank Shape	N/A	Right Bank Shape		N/A				
Left Bank Texture	N/A	Right Bank Texture		N/A				
Left Bank Riparian Vegetation	N/A	Right Bank Riparian Vegetation		N/A				
Left Bank Stage	N/A	Right Bank Stage		N/A				
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Not visited	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments								
Upstream of site.								
Site Comments		<p>No culvert at road, no possible fish passage across road. Evidence of old wooden log structure to allow drainage. Wood is rotten and collapsed, no surface drainage possible. Subsurface seepage carries water under road. Pooled water observed upstream of road. No channel observed downstream of road.</p>						
Notes:		Cover	Fish Species	Stream Class	Non-fish bearing			
N/A Assessed but no data to report		SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	Fish bearing			
		LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m		
		B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m		
		UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel		
		DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage		
		OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.		
		IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon				
				TSB Threespine stickleback				

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD167	Structure No.	
Watershed Code:	910-665062-09000	Stream Order	2		
Stream Name	Unnamed	Stream Class	S2		
Crew	IM, NN, CW	UTM_Zone	09	UTM Northing	5992542
Survey Date	6/18/2015			UTM Easting	519193
Time	11:07:32	Site Length (m)	100		
Channel	Visible Channel	Features	None		
Mean Channel Width (m)	8.67	Mean Wetted Width (m)	5.43	Mean Residual Pool Depth (m)	0.37
Mean Gradient (%)	10	Dominate Substrate	Cobbles	Sub-dominate Substrate	Boulders
In-stream Cover	Moderate	Dominant cover	B	Sub-dominant cover	DP, OV

Water Quality	Temperature (Deg C)	9.1	pH	7.9	Conductivity (uS/cm)	64	Turbidity	C-Clear
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Riparian Vegetation		Crown Closure	41-70%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Boulder/Block	Right Bank Texture	Boulder/Block
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	Poor - Patches of gravel for trout, no access for salmon.	
Rearing	Good - Good cover, good habitat variety, cascade upstream, large falls downstream.	
Overwintering	Poor - Few deep pools.	
Migration	Poor - Cascade likely passable only at high flows.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Yes	Species Captured-2015	RB	Species Stage-2015	Fry, Parr
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments	Downstream extent of the survey.
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Site Comments	Large series of falls downstream of site, 3 falls, 4 to 6 m tall. No access for fish up falls. Braided channel at crossing site. Good rearing trout habitat. RB captured, likely resident population upstream of falls barriers. Cascade at upstream end of site acts as partial barrier for small fish. Adults may pass during high flows.
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Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD168 / Site 42	Structure No.				
Watershed Code:	910-665062-09000	Stream Order	1					
Stream Name	Unnamed	Stream Class	S6					
Crew	NN, IM	UTM_Zone	09	UTM Northing	5992185			
Survey Date	5/11/2016			UTM Easting	519032			
Time	16:44:09	Site Length (m)	100					
Channel	Visible channel	Features	C - Cascade or chute					
Mean Channel Width (m)	2.03	Mean Wetted Width (m)	1.54	Mean Residual Pool Depth (m)	0.13			
Mean Gradient (%)	32	Dominate Substrate	Cobbles	Sub-dominate Substrate	Boulders			
In-stream Cover	Moderate	Dominant cover	B	Sub-dominant cover	LWD, SWD, DP			
Water Quality	Temperature (Deg C)	8.8	pH	8.3	Conductivity (uS/cm)	123	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	21-40%				
Left Bank Shape	Undercut		Right Bank Shape	Sloping				
Left Bank Texture	Cobbles		Right Bank Texture	Cobbles				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No migration to site is possible because of steep gradient. No spawning habitat is available.							
Rearing	None - Gradient is too steep to support rearing fishes.							
Overwintering	None - No access due to gradient barrier and falls.							
Migration	None - Too steep to allow fish access.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments	Steep section downstream of surveyed reach 37% gradient.							
Site Comments	Channel too steep to support fish habitat at crossing location. Crossing site was electrofished in 2016, no fish were captured. Stream was electrofished approximately 300 m downstream and captured juvenile rainbow trout.							
Notes:	Cover	Fish Species	Stream Class	Non-fish bearing				
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon	NCD and wetlands are non-fish bearing except where noted.				
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD170			Structure No.	
Watershed Code:	No data		Stream Order	N/A			
Stream Name	Unnamed		Stream Class	NVC			
Crew	DF, NN		UTM_Zone	09	UTM Northing	5992080	
Survey Date	7/7/2016				UTM Easting	520478	
Time	13:06:09		Site Length (m)	100			
Channel	No Visible Channel		Features	None			
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A	
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A	
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A	
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity
							N/A
Riparian Vegetation			Crown Closure		N/A		
Left Bank Shape	N/A		Right Bank Shape		N/A		
Left Bank Texture	N/A		Right Bank Texture		N/A		
Left Bank Riparian Vegetation	N/A		Right Bank Riparian Vegetation		N/A		
Left Bank Stage	N/A		Right Bank Stage		N/A		
Habitat Comments	Fish Species	N/A					
Spawning	N/A						
Rearing	N/A						
Overwintering	N/A						
Migration	N/A						
Fish Information	Historical Fish Presence	No data					
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A	
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A	
Photo Comments							
Upslope of the road.							
Site Comments			No channel, water, scour or fish habitat.				

Notes:	Cover	Fish Species		Stream Class	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	<u>Fish bearing</u>	<u>Non-fish bearing</u>
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon		
			TSB Threespine stickleback		

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	RD177		Structure No.			
Watershed Code:	No data		Stream Order	1				
Stream Name	Unnamed		Stream Class	S3				
Crew	IM, NN		UTM_Zone	09	UTM Northing	5990813		
Survey Date	5/10/2016				UTM Easting	518874		
Time	14:28:44		Site Length (m)	100				
Channel	Visible channel		Features	None				
Mean Channel Width (m)	2.15	Mean Wetted Width (m)	1.42	Mean Residual Pool Depth (m)			0.10	
Mean Gradient (%)	13	Dominate Substrate	Boulders	Sub-dominate Substrate		Cobbles		
In-stream Cover	Abundant	Dominant cover	B	Sub-dominant cover		LWD, SWD,IV, OV		
Water Quality	Temperature (Deg C)	4.9	pH	6.4	Conductivity (uS/cm)	17	Turbidity	C-Clear
Riparian Vegetation			Crown Closure			41-70%		
Left Bank Shape		Sloping		Right Bank Shape		Sloping		
Left Bank Texture		Fines		Right Bank Texture		Fines		
Left Bank Riparian Vegetation		Coniferous		Right Bank Riparian Vegetation		Coniferous		
Left Bank Stage		Young Forest		Right Bank Stage		Young Forest		
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No spawning gravel bars, large coarse substrates only. Likely no access for spawners.							
Rearing	Poor - If juveniles can access reach, poor rearing habitat present during, possibly better in higher water periods. Abundant diverse cover, but limited depth and no deep pool habitat. Cascades also present to limit upstream travel by juveniles.							
Overwintering	None - None, no deep pools, likely freezes to bottom.							
Migration	None - Adult access limited by flow depth. During freshet, higher depths may be present but steep gradient may cause fast, impassable flows.							
Fish Information	Historical Fish Presence		No data					
Fished -2015	Not visited	Species Captured-2015		N/A		Species Stage-2015	N/A	
Fished -2016	Yes	Species Captured-2016		NFC		Species Stage-2016	N/A	

### Photo Comments


Steep section downstream of surveyed reach (37% gradient).


### Site Comments

Narrow small stream in steep rocky gully. Boulders, cobbles, present throughout, possibly indicating high flows that would remove fine particles. Upper reach is flatter and slower moving, gradient increases towards downstream end of reach. No barriers to passage observed in reach. Fish access is dependent on fish access to lake outlet stream upstream. Habitat generally moderate to poor for small juvenile salmonids. Large fish would have trouble accessing site due to limited water depth. Downstream of site there is a short section of channel with a gradient of 37%. This steep section may be a barrier to fish passage. Downstream fish access should be re-evaluated at a different time of year to confirm fish-bearing status.





<b>Notes:</b> N/A Assessed but no data to report	<b>Cover</b>		<b>Fish Species</b>		<b>Stream Class</b>	
	SWD	Small woody debris	AS	Atlantic salmon	<u>Fish bearing</u>	<u>Non-fish bearing</u>
	LWD	Large woody debris	CC	Sculpins	S1 > 20 m	S5 > 3 m
	B	Boulder	CCT	Coastal cutthroat trout	S2 > 5 m - 20 m	S6 < 3 m
	UC	Undercut bank	CH	Chinook salmon	S3 1.5 m - 5 m	NVC No visible channel
	DP	Deep pools	CM	Chum salmon	S4 < 1.5 m	NCD Non-classified drainage
	OV	Overhanging vegetation	CO	Coho salmon		NCD and wetlands are non-fish bearing except where noted.
	IV	Instream vegetation	CCG	Slimy sculpin		
			DV	Dolly varden		
			L	Lamprey		
			PK	Pink salmon		
			PL	Pacific Lamprey		
			RB	Rainbow trout		
			SA	Salmon		
			SK	Sockeye salmon		
			TSB	Threespine stickleback		

<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	RD178		Structure No.	
Watershed Code:	910-665062-04593		Stream Order	1		
Stream Name	Unnamed		Stream Class	NCD		
Crew	IM, HC, WM		UTM_Zone	09	UTM Northing	5989823
Survey Date	7/7/2016				UTM Easting	519049
Time	15:45:37		Site Length (m)	100		
Channel	Other		Features	None		
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)		No data
Mean Gradient (%)	No data	Dominate Substrate	No data	Sub-dominate Substrate		No data
In-stream Cover	N/A	Dominant cover	-	Sub-dominant cover		-
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data
					Turbidity	No data
Riparian Vegetation			Crown Closure		No data	
Left Bank Shape		No data	Right Bank Shape		No data	
Left Bank Texture		No data	Right Bank Texture		No data	
Left Bank Riparian Vegetation		No data	Right Bank Riparian Vegetation		No data	
Left Bank Stage		No data	Right Bank Stage		No data	
Habitat Comments	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A
Photo Comments						
Crossing site.						
Site Comments						
<p>Crossing site is steep, dry gully, choked with fallen large woody debris. Large cobble and boulder substrates present. Drainage is steep, 38% grade at site. No fish habitat, no fish access, no fish present. Short channel segments &lt;5m long observed through the woody debris. No measurements taken due to abundance of woody debris.</p>						
Notes:	Cover	Fish Species		Stream Class		
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.	



<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	Rd19R_193		Structure No.			
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	NVC					
Crew	DF, NN	UTM_Zone	09	UTM Northing	6029675			
Survey Date	7/6/2016			UTM Easting	522768			
Time	10:15:22	Site Length (m)	100					
Channel	Non-classified Drainage		Features	None				
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)	No data			
Mean Gradient (%)	No data	Dominate Substrate	Fines	Sub-dominate Substrate	Fines			
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A			
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
Riparian Vegetation			Crown Closure	N/A				
Left Bank Shape	Sloping		Right Bank Shape	Sloping				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest				
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments								
From upstream of the culvert.								
Site Comments								
Small ditch on upstream side of road passes through 300 mm culvert to cross road. Downstream of culvert there is no channel, scour or alluvial deposits. No water, flow or fisheries potential at this location.								
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	<u>Fish bearing</u>				
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Rd21R_3359			Structure No.		
Watershed Code:	No data		Stream Order	1				
Stream Name	Unnamed		Stream Class	S3				
Crew	DF, IM, HC, NN		UTM_Zone	09	UTM Northing	6030858		
Survey Date	6/27/2016				UTM Easting	522494		
Time	16:17:25		Site Length (m)	100				
Channel	Dry Channel		Features	CV - Culvert				
Mean Channel Width (m)	1.79	Mean Wetted Width (m)	0.00	Mean Residual Pool Depth (m)		0.00		
Mean Gradient (%)	3	Dominate Substrate	Fines	Sub-dominate Substrate		Gravels		
In-stream Cover	None	Dominant cover	OV	Sub-dominant cover		LWD, SWD		
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
<b>Riparian Vegetation</b>			Crown Closure		71-90%			
Left Bank Shape		Sloping		Right Bank Shape		Sloping		
Left Bank Texture		Fines		Right Bank Texture		Fines		
Left Bank Riparian Vegetation		Mixedwood		Right Bank Riparian Vegetation		Mixedwood		
Left Bank Stage		Young Forest		Right Bank Stage		Young Forest		
<b>Habitat Comments</b>	Fish Species	AO - All Salmonids						
Spawning	None - No flows or suitable substrates.							
Rearing	Poor - May enter during times of high flow.							
Overwintering	None - No flow during survey.							
Migration	None - Dry channel.							
<b>Fish Information</b>	Historical Fish Presence		No data					
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
<b>Photo Comments</b>								
Crossing location looking downstream.								
<b>Site Comments</b>								
Upstream of crossing is defined channel for 50 m, then becomes undefined vegetated drainage upstream. Downstream is more defined channel, coarser substrates. Pooled water present in channel 75 m downstream down to railroad crossing culvert. Water trickling through perched pipe. No fish access to site currently. No water at crossing, railroad culvert is currently a barrier. Very low probability of fish access to site during high water periods.								
<b>Notes:</b>	<b>Cover</b>	<b>Fish Species</b>	<b>Stream Class</b>		<b>Non-fish bearing</b>			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	<u>Fish bearing</u>	<u>Non-fish bearing</u>			
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road		Site Number		Rd21R_3362		Structure No.	
Watershed Code:	No data			Stream Order	N/A			
Stream Name	Unnamed			Stream Class	NVC			
Crew	HC, NN			UTM_Zone	09	UTM Northing		6030916
Survey Date	6/27/2016					UTM Easting		522537
Time	16:54:48			Site Length (m)	100			
Channel	No Visible Channel			Features	None			
Mean Channel Width (m)	N/A	Mean Wetted Width (m)		N/A	Mean Residual Pool Depth (m)			N/A
Mean Gradient (%)	N/A	Dominate Substrate		N/A	Sub-dominate Substrate			N/A
In-stream Cover	N/A	Dominant cover		N/A	Sub-dominant cover			N/A
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation				Crown Closure			N/A	
Left Bank Shape		N/A		Right Bank Shape			N/A	
Left Bank Texture		N/A		Right Bank Texture			N/A	
Left Bank Riparian Vegetation		N/A		Right Bank Riparian Vegetation			N/A	
Left Bank Stage		N/A		Right Bank Stage			N/A	
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence		No data					
Fished -2015	Not visited	Species Captured-2015			N/A		Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016			N/A		Species Stage-2016	N/A

### Photo Comments

At crossing, on road. Upstream only scour hole, no channel development.

### Site Comments

No scour, no water at time of survey. Depression area, likely collects runoff or snowmelt. No alluvial deposition/substrates.



<b>Notes:</b> N/A Assessed but no data to report	<b>Cover</b>		<b>Fish Species</b>		<b>Stream Class</b>	
	SWD	Small woody debris	AS	Atlantic salmon	<u>Fish bearing</u>	<u>Non-fish bearing</u>
	LWD	Large woody debris	CC	Sculpins	S1 > 20 m	S5 > 3 m
	B	Boulder	CCT	Coastal cutthroat trout	S2 > 5 m - 20 m	S6 < 3 m
	UC	Undercut bank	CH	Chinook salmon	S3 1.5 m - 5 m	NVC No visible channel
	DP	Deep pools	CM	Chum salmon	S4 < 1.5 m	NCD Non-classified drainage
	OV	Overhanging vegetation	CO	Coho salmon		NCD and wetlands are non-fish bearing except where noted.
	IV	Instream vegetation	CCG	Slimy sculpin		
			DV	Dolly varden		
			L	Lamprey		
			PK	Pink salmon		
			PL	Pacific Lamprey		
			RB	Rainbow trout		
			SA	Salmon		
			SK	Sockeye salmon		
			TSB	Threespine stickleback		



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Rd21R_3363		Structure No.	
Watershed Code:	No data	Stream Order	1			
Stream Name	Unnamed	Stream Class	NCD			
Crew	DF, NN	UTM_Zone	09	UTM Northing	6029596	
Survey Date	7/6/2016			UTM Easting	522756	
Time	10:26:12	Site Length (m)	100			
Channel	Non-classified Drainage		Features	None		
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)	No data	
Mean Gradient (%)	No data	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels	
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A	
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data
					Turbidity	No data
Riparian Vegetation			Crown Closure	N/A		
Left Bank Shape	Sloping		Right Bank Shape	Sloping		
Left Bank Texture	Fines		Right Bank Texture	Fines		
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood		
Left Bank Stage	Young Forest		Right Bank Stage	Young Forest		
Habitat Comments	Fish Species	N/A				
Spawning	N/A					
Rearing	N/A					
Overwintering	N/A					
Migration	N/A					
Fish Information	Historical Fish Presence	No data				
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A	
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A	
Photo Comments						
<p>From the road showing the ditch upstream and the lack of channel development downstream.</p>						
Site Comments			<p>Ditch on the upstream side of the road crosses the road through a low area. Downstream of the road there is channel development for approximately 5m before becoming non-classified drainage. Further downstream there is no channel development, scour or alluvial deposits. No water was present at time of survey. No fisheries potential.</p>			
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing	
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	Fish bearing	S5 > 3 m	
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S6 < 3 m	
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	NVC No visible channel	
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NCD Non-classified drainage	
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD and wetlands are non-fish bearing except where noted.	
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon			
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback			

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Rd21R_3364			Structure No.		
Watershed Code:	No data		Stream Order	N/A				
Stream Name	Unnamed		Stream Class	NVC				
Crew	IM, NN		UTM_Zone	09	UTM Northing	6029497		
Survey Date	5/9/2016				UTM Easting	522727		
Time	16:34:26		Site Length (m)	100				
Channel	No Visible Channel		Features	None				
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A		
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
<b>Riparian Vegetation</b>			Crown Closure		N/A			
Left Bank Shape			N/A		Right Bank Shape			N/A
Left Bank Texture			N/A		Right Bank Texture			N/A
Left Bank Riparian Vegetation			N/A		Right Bank Riparian Vegetation			N/A
Left Bank Stage			N/A		Right Bank Stage			N/A
<b>Habitat Comments</b>	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
<b>Fish Information</b>	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
<b>Photo Comments</b>								
Upslope of existing access road.								
<b>Site Comments</b>			<p>Downslope of road has some small intermittent pools. Very low flow runs subsurface for majority of length of the site. Dry gully again further downslope.</p>					
<b>Notes:</b>			<p>N/A Assessed but no data to report</p>					
<b>Cover</b>			<b>Fish Species</b>		<b>Stream Class</b>			
SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation			AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin		DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback			
					<b>Fish bearing</b> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m			
					<b>Non-fish bearing</b> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.			

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Rd21R_3367	Structure No.	45
Watershed Code:	No data	Stream Order	N/A		
Stream Name	Unnamed	Stream Class	NVC		
Crew	IM, NN	UTM_Zone	09	UTM Northing	6029889
Survey Date	5/9/2016			UTM Easting	522775
Time	17:18:28	Site Length (m)	100		
Channel	No Visible Channel	Features	None		
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A

Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
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Riparian Vegetation		Crown Closure	N/A
Left Bank Shape	N/A	Right Bank Shape	N/A
Left Bank Texture	N/A	Right Bank Texture	N/A
Left Bank Riparian Vegetation	N/A	Right Bank Riparian Vegetation	N/A
Left Bank Stage	N/A	Right Bank Stage	N/A

Habitat Comments	Fish Species	N/A
Spawning	N/A	
Rearing	N/A	
Overwintering	N/A	
Migration	N/A	

Fish Information	Historical Fish Presence		No data		
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments	Looking upstream from cross drainage ditch carrying ditch flows across track and down steep slope.
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Site Comments	Cross drainage ditch carrying ditch flows across track and down steep slope. Slope downstream of crossing is > 45%. Joins larger creek approx 40 m downslope. Some short intermittent scoured sections. No water, too steep for fish.
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Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Rd21R_3370			Structure No.	19	
Watershed Code:	No data		Stream Order	N/A				
Stream Name	Unnamed		Stream Class	NVC				
Crew	IM, NN		UTM_Zone	09	UTM Northing	6029767		
Survey Date	5/9/2016				UTM Easting	522758		
Time	17:06:59		Site Length (m)	100				
Channel	No Visible Channel		Features	None				
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A		
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation			Crown Closure		N/A			
Left Bank Shape		N/A	Right Bank Shape		N/A			
Left Bank Texture		N/A	Right Bank Texture		N/A			
Left Bank Riparian Vegetation		N/A	Right Bank Riparian Vegetation		N/A			
Left Bank Stage		N/A	Right Bank Stage		N/A			
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence		No data					
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments								
<p>Cross road drainage ditch, fed by ditches on upslope side of road. No natural channel observed upstream of crossing site.</p>								
Site Comments			<p>No water, no fish, and steep slope.</p>					
Notes:			<p>N/A Assessed but no data to report</p>					
Cover			Fish Species		Stream Class			
<p>SWD Small woody debris</p> <p>LWD Large woody debris</p> <p>B Boulder</p> <p>UC Undercut bank</p> <p>DP Deep pools</p> <p>OV Overhanging vegetation</p> <p>IV Instream vegetation</p>			<p>AS Atlantic salmon</p> <p>CC Sculpins</p> <p>CCT Coastal cutthroat trout</p> <p>CH Chinook salmon</p> <p>CM Chum salmon</p> <p>CO Coho salmon</p> <p>CCG Slimy sculpin</p>		<p>DV Dolly varden</p> <p>L Lamprey</p> <p>PK Pink salmon</p> <p>PL Pacific Lamprey</p> <p>RB Rainbow trout</p> <p>SA Salmon</p> <p>SK Sockeye salmon</p> <p>TSB Threespine stickleback</p>			
					<p>Fish bearing</p> <p>S1 &gt; 20 m</p> <p>S2 &gt; 5 m - 20 m</p> <p>S3 1.5 m - 5 m</p> <p>S4 &lt; 1.5 m</p>			
					<p>Non-fish bearing</p> <p>S5 &gt; 3 m</p> <p>S6 &lt; 3 m</p> <p>NVC No visible channel</p> <p>NCD Non-classified drainage</p> <p>NCD and wetlands are non-fish bearing except where noted.</p>			

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Rd21R_3372	Structure No.	
Watershed Code:	No data	Stream Order	1		
Stream Name	Unnamed	Stream Class	NCD		
Crew	DF, NN	UTM_Zone	09	UTM Northing	6029686
Survey Date	7/6/2016			UTM Easting	522753
Time	10:05:14	Site Length (m)	100		
Channel	Non-classified Drainage	Features	None		
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)	No data
Mean Gradient (%)	No data	Dominate Substrate	Fines	Sub-dominate Substrate	Gravels
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A

Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
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Riparian Vegetation		Crown Closure	N/A
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Coniferous	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	N/A
Spawning	N/A	
Rearing	N/A	
Overwintering	N/A	
Migration	N/A	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments	
From the road crossing looking downstream.	

Site Comments	
Small ditch crossing the road. Upstream of the road the channel runs in the roadside ditch for approximately 30m. Downstream the channel disappears into an open forest floor. No channel development, alluvial deposits or fisheries potential.	



Notes:	Cover	Fish Species	Stream Class
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback
			Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m
			Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Rd21R_3373	Structure No.	
Watershed Code:	No data	Stream Order	1		
Stream Name	Unnamed	Stream Class	NCD		
Crew	DF, NN	UTM_Zone	09	UTM Northing	6030030
Survey Date	7/6/2016			UTM Easting	522746
Time	09:37:40	Site Length (m)	100		
Channel	Non-classified Drainage	Features	None		
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)	No data
Mean Gradient (%)	No data	Dominate Substrate	Fines	Sub-dominate Substrate	Fines
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A

Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
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Riparian Vegetation		Crown Closure	N/A
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	N/A
Spawning	N/A	
Rearing	N/A	
Overwintering	N/A	
Migration	N/A	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A

Photo Comments	
From road at the crossing location looking upstream.	

Site Comments	
Small ditch crossing the road. No defined channel upstream or downstream of the road. No alluvial deposits or continuous channel. Only gravel or cobble is at the road crossing. No fisheries potential.	



Notes:	Cover	Fish Species	Stream Class	Non-fish bearing
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

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Project No VE52379

Date 28-Oct-16




Crossing Type	Access Road	Site Number	Rd-24r216			Structure No.	
Watershed Code:	No data		Stream Order	N/A			
Stream Name	Unnamed		Stream Class	NVC			
Crew	HC, IM, JS		UTM_Zone	09	UTM Northing	6028102	
Survey Date	7/1/2016				UTM Easting	521534	
Time	10:58:21		Site Length (m)	100			
Channel	Other		Features	None			
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A	
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A	
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A	

Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
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<b>Riparian Vegetation</b>			Crown Closure		N/A		
Left Bank Shape	N/A		Right Bank Shape		N/A		
Left Bank Texture	N/A		Right Bank Texture		N/A		
Left Bank Riparian Vegetation	N/A		Right Bank Riparian Vegetation		N/A		
Left Bank Stage	N/A		Right Bank Stage		N/A		


Habitat Comments	Fish Species	N/A
Spawning	N/A	
Rearing	N/A	
Overwintering	N/A	
Migration	N/A	


<b>Fish Information</b>	Historical Fish Presence	No data					
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A	
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A	



<p><b>Photo Comments</b></p> <p>Drainage downslope of the culvert site. No channelization.</p>	
<p><b>Site Comments</b></p> <p>Road drainage ditch feeds into culvert inlet. Upstream of inlet steep forested slope. Downstream of outlet dry drainage ditch through mixed wood forest. Non-fish bearing. Feeds into wetland habitat assessed as non-fish bearing.</p>	

<b>Notes:</b> N/A Assessed but no data to report	<b>Cover</b>		<b>Fish Species</b>		<b>Stream Class</b>	
	SWD	Small woody debris	AS	Atlantic salmon	<u>Fish bearing</u>	<u>Non-fish bearing</u>
	LWD	Large woody debris	CC	Sculpins	S1 > 20 m	S5 > 3 m
	B	Boulder	CCT	Coastal cutthroat trout	S2 > 5 m - 20 m	S6 < 3 m
	UC	Undercut bank	CH	Chinook salmon	S3 1.5 m - 5 m	NVC No visible channel
	DP	Deep pools	CM	Chum salmon	S4 < 1.5 m	NCD Non-classified drainage
	OV	Overhanging vegetation	CO	Coho salmon		NCD and wetlands are non-fish bearing except where noted.
	IV	Instream vegetation	CCG	Slimy sculpin		
			DV	Dolly varden		
			L	Lamprey		
			PK	Pink salmon		
			PL	Pacific Lamprey		
			RB	Rainbow trout		
			SA	Salmon		
			SK	Sockeye salmon		
			TSB	Threespine stickleback		

<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	Rd6R_2356		Structure No.			
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	S3					
Crew	DF, NN	UTM_Zone	09	UTM Northing	6032330			
Survey Date	6/28/2016			UTM Easting	523633			
Time	17:50:54	Site Length (m)	100					
Channel	Dry Channel		Features	CV - Culvert				
Mean Channel Width (m)	1.60	Mean Wetted Width (m)	0.02	Mean Residual Pool Depth (m)	0.03			
Mean Gradient (%)	4	Dominate Substrate	Fines	Sub-dominate Substrate	Fines			
In-stream Cover	Moderate	Dominant cover	LWD	Sub-dominant cover	SWD, OV			
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
Riparian Vegetation			Crown Closure	71-90%				
Left Bank Shape	Vertical	Right Bank Shape	Undercut					
Left Bank Texture	Fines	Right Bank Texture	Fines					
Left Bank Riparian Vegetation	Coniferous	Right Bank Riparian Vegetation	Mixedwood					
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest					
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No clean gravels present.							
Rearing	Poor - Dry channel. May provide habitat during higher flows.							
Overwintering	None - No water in deep pools for overwintering.							
Migration	Poor - Dry channel at time of survey however there were no other barriers observed and access may be possible at high flows.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016	N/A			
Photo Comments								
Upstream extent of study area. Shows limited channel development.								
Site Comments		<p>Stream has poor channel development upstream of the culvert. Below culvert the channel becomes more confined and has a steeper gradient. Mostly dry channel with some small isolated pools at the downstream extent not connected by overland flow. Stream may contain fish habitat at high-flow conditions.</p>						
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	PK Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	RB Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	SA Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SK Salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	TSB Sockeye salmon					
			Threespine stickleback					

<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	Rd6R_2357		Structure No.			
Watershed Code:	No data	Stream Order	N/A					
Stream Name	Unnamed	Stream Class	NVC					
Crew	IM, HC, JS	UTM_Zone	09	UTM Northing	6032295			
Survey Date	7/4/2016			UTM Easting	523653			
Time	13:51:58	Site Length (m)	100					
Channel	Other	Features	None					
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A			
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A			
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A			
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation			Crown Closure		N/A			
Left Bank Shape		N/A	Right Bank Shape		N/A			
Left Bank Texture		N/A	Right Bank Texture		N/A			
Left Bank Riparian Vegetation		N/A	Right Bank Riparian Vegetation		N/A			
Left Bank Stage		N/A	Right Bank Stage		N/A			
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments								
Marked crossing site.								
Site Comments								
<p>Site consists of an upslope ditch drainage that collects upslope runoff, then drains to the west to join the drainage at site Rd6r 2356, upstream of that marked crossing site. No cross road drainage was identified at site Rd6R_2357. No culvert or overland flow evidence can be found at this site. Downstream no channel development or evidence of flowing water. It is a local landscape depression, with no fish potential or fish habitat. Non-fish bearing.</p>								
Notes:	Cover	Fish Species	Stream Class		Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.			



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog



Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Rd74R_2801			Structure No.		
Watershed Code:	No data		Stream Order	1				
Stream Name	Unnamed		Stream Class	NVC				
Crew	DF, NN		UTM_Zone	09	UTM Northing	6013037		
Survey Date	7/2/2016				UTM Easting	522925		
Time	14:30:41		Site Length (m)	100				
Channel	Non-classified Drainage		Features	None				
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)		No data		
Mean Gradient (%)	No data	Dominate Substrate	Fines	Sub-dominate Substrate		Fines		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
Riparian Vegetation			Crown Closure		N/A			
Left Bank Shape		Sloping		Right Bank Shape		Sloping		
Left Bank Texture		Fines		Right Bank Texture		Fines		
Left Bank Riparian Vegetation		Mixedwood		Right Bank Riparian Vegetation		Mixedwood		
Left Bank Stage		Young Forest		Right Bank Stage		Young Forest		
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence		No data					
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments								
From road showing ditch crossing but no channel upstream or downstream.								
Site Comments			<p>Shallow ditch crossing over the road. No defined channel upstream or downstream. Gravels present on ditch on road but no coarse substrate upstream or downstream. No scour, flow or continuous channel.</p>					
Notes:			<p>N/A Assessed but no data to report</p>					
Cover			Fish Species		Stream Class			
SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation			AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin		DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback			
					Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m			
					Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.			

Terrace to Kitimat Transmission Project (TKTP) Freshwater Fish and Fish Habitat Catalog						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	
Crossing Type	Access Road	Site Number	Rd74r_328			Structure No.		
Watershed Code:	No data		Stream Order	1				
Stream Name	Unnamed		Stream Class	NCD				
Crew	NN, JR, DF		UTM_Zone	09	UTM Northing	6013083		
Survey Date	7/2/2016				UTM Easting	522880		
Time	14:47:08		Site Length (m)	100				
Channel	Non-classified Drainage		Features	None				
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)			No data	
Mean Gradient (%)	No data	Dominate Substrate	Fines	Sub-dominate Substrate		Fines		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
Riparian Vegetation			Crown Closure		N/A			
Left Bank Shape		Sloping		Right Bank Shape		Sloping		
Left Bank Texture		Fines		Right Bank Texture		Fines		
Left Bank Riparian Vegetation		Mixedwood		Right Bank Riparian Vegetation		Mixedwood		
Left Bank Stage		Young Forest		Right Bank Stage		Young Forest		
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence		No data					
Fished -2015	Not visited	Species Captured-2015		N/A		Species Stage-2015		N/A
Fished -2016	No	Species Captured-2016		N/A		Species Stage-2016		N/A
Photo Comments								
Downslope view.								
Site Comments								
<p>Short section of channel, some isolated water, 10 m section of scour with some alluvials. Set traps initially but further investigation shows no continuous channel &gt; 100m. Water about 40 cm deep in places, channel is 1-2 m wide. Alder forest thick understory near wet NCD . Salmon berry, club, elderberry etc.</p>								
Notes:	Cover	Fish Species		Stream Class		Non-fish bearing		
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin		DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback		Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.		

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Site 30	Structure No.				
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	S2					
Crew	NN, IM	UTM_Zone	09	UTM Northing	5993223			
Survey Date	5/12/2016			UTM Easting	521193			
Time	15:39:23	Site Length (m)	150					
Channel	Visible channel	Features	CV - Culvert					
Mean Channel Width (m)	9.45	Mean Wetted Width (m)	6.42	Mean Residual Pool Depth (m)	0.71			
Mean Gradient (%)	1	Dominate Substrate	Gravels	Sub-dominate Substrate	Cobbles			
In-stream Cover	Abundant	Dominant cover	DP, IV	Sub-dominant cover	SWD, OV			
Water Quality	Temperature (Deg C)	8.5	pH	7.4	Conductivity (uS/cm)	60	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	21-40%				
Left Bank Shape	Sloping		Right Bank Shape	Sloping				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Mixedwood		Right Bank Riparian Vegetation	Mixedwood				
Left Bank Stage	Mature Forest		Right Bank Stage	Mature Forest				
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Good - Critical back channel spawning habitat for coho and likely other species.							
Rearing	Excellent - Good rearing habitat. Groundwater springs observed. Abundant cover elements for all life stages.							
Overwintering	Good - Deep pools exist and likely good year-round flows due to groundwater springs.							
Migration	Moderate - Migration somewhat obstructed by crossing. Two of the three culverts are crushed, but the 800 mm culvert is intact and allows fish passage.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A			
Fished -2016	Yes	Species Captured-2016	CO, TSB	Species Stage-2016	Fry, Adult			
Photo Comments	Typical channel downstream of the crossing site, facing downstream.							
Site Comments	Back-channel habitat offers excellent rearing for young salmon and trout. Abundant coho and threespine stickleback observed and captured in the channel upstream and downstream of the crossing site. Three culverts are present at the crossing site. Two are crushed, but the largest (800 mm diameter) culvert is intact and allows fish passage at higher flow periods.							
Notes:	Cover	Fish Species		Stream Class				
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.			



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Site 39	Structure No.
Watershed Code:	No data	Stream Order	1	
Stream Name	Unnamed	Stream Class	S3	
Crew	IM, HC, WM	UTM_Zone	09	UTM Northing 5990481
Survey Date	7/7/2016			UTM Easting 518737
Time	13:26:13	Site Length (m)	100	
Channel	Visible channel	Features	None	
Mean Channel Width (m)	1.93	Mean Wetted Width (m)	1.33	Mean Residual Pool Depth (m) 0.18
Mean Gradient (%)	5	Dominate Substrate	Gravels	Sub-dominate Substrate Cobbles
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover LWD, SWD,IV
Water Quality	Temperature (Deg C) 16.2	pH 7.6	Conductivity (uS/cm) 64	Turbidity C-Clear
Riparian Vegetation		Crown Closure	21-40%	
Left Bank Shape	Sloping	Right Bank Shape	Sloping	
Left Bank Texture	Fines	Right Bank Texture	Fines	
Left Bank Riparian Vegetation	Coniferous	Right Bank Riparian Vegetation	Coniferous	
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest	
Habitat Comments	Fish Species	AO - All Salmonids		
Spawning	Moderate - Some spawning gravels present in small pockets throughout stream.			
Rearing	Good - Abundant cover, good channel diversity, good flow depths. Limited by cascades.			
Overwintering	Poor - Limited deep pools in channel. Lake upstream may provide overwintering opportunities if accessible during high flows.			
Migration	Moderate - Barriers identified include downstream waterfall, and cascade section.			
Fish Information	Historical Fish Presence	No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015 N/A
Fished -2016	Yes	Species Captured-2016	NFC	Species Stage-2016 N/A
Photo Comments	Subsurface flow site in overflow channel.			
Site Comments	<p>Site has a flowing defined channel in a steep-walled valley, with a moderately high gradient. Site is outlet stream for lake, located upstream of a barrier waterfall. Site has diverse habitat, with pools, riffles, cascades. Abundant cover, mostly provided by overhanging vegetation. Coarse substrates at downstream end of site, becoming more fine upstream. Moderate to good quality stream for salmonids, if a resident population is present in the lake. Upstream of site, stream becomes intermittently defined and wider. Upstream, 60 m downstream of lake, stream flows subsurface. Water flows from under a defined overflow channel from the lake. Currently no fish access to site from lake, although presence of scoured channel indicates that water may periodically flow at high water. Electrofishing done at crossing site, no fish captured or observed.</p>			
Notes:	Cover	Fish Species	Stream Class	
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog


Prepared for BC Hydro


Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Site 40	Structure No.				
Watershed Code:	910-665062-04593	Stream Order	N/A					
Stream Name	Unnamed	Stream Class	NVC					
Crew	IM, NN, CW	UTM_Zone	09	UTM Northing	5988906			
Survey Date	6/17/2015			UTM Easting	518552			
Time	14:52:09	Site Length (m)	100					
Channel	No Visible Channel	Features	None					
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)	N/A			
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate	N/A			
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover	N/A			
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
Riparian Vegetation					Crown Closure	N/A		
Left Bank Shape	N/A				Right Bank Shape	N/A		
Left Bank Texture	N/A				Right Bank Texture	N/A		
Left Bank Riparian Vegetation	N/A				Right Bank Riparian Vegetation	N/A		
Left Bank Stage	N/A				Right Bank Stage	N/A		
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Not visited	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments	NVC downstream of crossing site.							
Site Comments	No visible channel downstream of crossing sites TL38 and TL37. No water, no flow, and no fish habitat, therefore no habitat at road site.							
Notes:	Cover	Fish Species			Stream Class			
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback		Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m		Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.	

<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	Site 45		Structure No.			
Watershed Code:	400-174068-59390		Stream Order	3				
Stream Name	Unnamed		Stream Class	S2				
Crew	DF, NN	UTM_Zone	09	UTM Northing	6022340			
Survey Date	6/29/2016			UTM Easting	522711			
Time	16:36:53		Site Length (m)	100				
Channel	Visible channel		Features	None				
Mean Channel Width (m)	10.13	Mean Wetted Width (m)	6.72	Mean Residual Pool Depth (m)	0.33			
Mean Gradient (%)	3	Dominate Substrate	Gravels	Sub-dominate Substrate	Cobbles			
In-stream Cover	Abundant	Dominant cover	LWD	Sub-dominant cover	SWD, B, DP, OV			
Water Quality	Temperature (Deg C)	13.1	pH	7.6	Conductivity (uS/cm)	25	Turbidity	C-Clear
Riparian Vegetation			Crown Closure		21-40%			
Left Bank Shape		Undercut	Right Bank Shape		Vertical			
Left Bank Texture		Fines	Right Bank Texture		Fines			
Left Bank Riparian Vegetation		Mixedwood	Right Bank Riparian Vegetation		Mixedwood			
Left Bank Stage		Mature Forest	Right Bank Stage		Mature Forest			
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Excellent - Range of substrate sizes available for different species. Good riffle and pool habitat.							
Rearing	Excellent - High amount of cover. Good riffle/pool habitat.							
Overwintering	Good - Good overwinter for juveniles. Adults likely move to deeper waters.							
Migration	Good - No barriers observed. Dry channel further upstream.							
Fish Information	Historical Fish Presence	N/A						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Yes	Species Captured-2016	CO		Species Stage-2016	Fry		
Photo Comments								
Upstream of bridge crossing location.								
Site Comments		Side and mid bars observed throughout study area. Fish observed throughout study area. Creek has good riffle/pool habitat. High cover diversity.						
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	<u>Fish bearing</u>	S5 > 3 m			
	LWD Large woody debris	CC Sculpins	PK Pink salmon	S1 > 20 m	S6 < 3 m			
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	S2 > 5 m - 20 m	NVC No visible channel			
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	S3 1.5 m - 5 m	NCD Non-classified drainage			
	DP Deep pools	CM Chum salmon	SA Salmon	S4 < 1.5 m	NCD and wetlands are non-fish bearing except where noted.			
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon					
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback					



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro



Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Site 50	Structure No.
Watershed Code:	910-665062-09749	Stream Order	1	
Stream Name	Unnamed	Stream Class	S3	
Crew	IM, NN	UTM_Zone	09	UTM Northing 5993044
Survey Date	6/19/2015			UTM Easting 519496
Time	16:53:53	Site Length (m)	100	
Channel	Visible Channel	Features	None	
Mean Channel Width (m)	1.68	Mean Wetted Width (m)	1.21	Mean Residual Pool Depth (m) 0.15
Mean Gradient (%)	16	Dominate Substrate	Cobbles	Sub-dominate Substrate Gravels
In-stream Cover	Moderate	Dominant cover	B	Sub-dominant cover LWD, SWD, OV, UC
Water Quality	Temperature (Deg C) 10.5	pH 7.9	Conductivity (uS/cm) 117	Turbidity C-Clear
Riparian Vegetation		Crown Closure	41-70%	
Left Bank Shape	Sloping	Right Bank Shape	Sloping	
Left Bank Texture	Gravels	Right Bank Texture	Gravels	
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood	
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest	
Habitat Comments	Fish Species AO - All Salmonids			
Spawning	None - No adequate gravel.			
Rearing	Moderate - Pool rearing habitat for juvenile trout is available but does not have much depth or area. Good variety of other cover types available.			
Overwintering	Poor - Possible overwintering for juvenile trout in shallow pools. Low flows and ice may prevent overwintering in most areas.			
Migration	Poor - Poor migration for trout, none for salmon, step pools present with low flow depth.			
Fish Information	Historical Fish Presence No data			
Fished -2015	Yes	Species Captured-2015	RB	Species Stage-2015 Parr
Fished -2016	Not visited	Species Captured-2016	N/A	Species Stage-2016 N/A
Photo Comments	Looking downstream from the crossing site.			
Site Comments	Moderate rearing for small juvenile trout. Pools support trout with good cover. Large bodied fish habitat is absent. Step pool morphology throughout with low flows.			
Notes:		Cover	Fish Species	Stream Class
N/A Assessed but no data to report		SWD Small woody debris	AS Atlantic salmon	Fish bearing
		LWD Large woody debris	CC Sculpins	S1 > 20 m
		B Boulder	CCT Coastal cutthroat trout	S2 > 5 m - 20 m
		UC Undercut bank	CH Chinook salmon	S3 1.5 m - 5 m
		DP Deep pools	CM Chum salmon	S4 < 1.5 m
		OV Overhanging vegetation	CO Coho salmon	
		IV Instream vegetation	CCG Slimy sculpin	
		DV Dolly varden	L Lamprey	
		PK Pink salmon	PL Pacific Lamprey	
		RB Rainbow trout	SA Salmon	
		SK Sockeye salmon	TSB Threespine stickleback	
				Non-fish bearing
				S5 > 3 m
				S6 < 3 m
				NVC No visible channel
				NCD Non-classified drainage
				NCD and wetlands are non-fish bearing except where noted.



Terrace to Kitimat Transmission Project (TKTP) Freshwater Fish and Fish Habitat Catalog						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	
Crossing Type	Access Road	Site Number	Sta 0+562			Structure No.		
Watershed Code:	No data		Stream Order	1				
Stream Name	Unnamed		Stream Class	NCD				
Crew	IM, NN		UTM_Zone	09	UTM Northing	6025308		
Survey Date	5/13/2016				UTM Easting	521658		
Time	13:51:38		Site Length (m)	120				
Channel	Visible channel		Features	BD - Beaver dam				
Mean Channel Width (m)	7.05	Mean Wetted Width (m)	6.72	Mean Residual Pool Depth (m)		0.62		
Mean Gradient (%)	0	Dominate Substrate	Fines	Sub-dominate Substrate		Fines		
In-stream Cover	Abundant	Dominant cover	IV	Sub-dominant cover		LWD, SWD, DP, OV		
Water Quality	Temperature (Deg C)	11.5	pH	7.5	Conductivity (uS/cm)	32	Turbidity	C-Clear
Riparian Vegetation			Crown Closure		41-70%			
Left Bank Shape		Sloping		Right Bank Shape		Sloping		
Left Bank Texture		Fines		Right Bank Texture		Fines		
Left Bank Riparian Vegetation		Coniferous		Right Bank Riparian Vegetation		Coniferous		
Left Bank Stage		Mature Forest		Right Bank Stage		Mature Forest		
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No access to site possible.							
Rearing	None - No access to site possible.							
Overwintering	None - No access to site possible.							
Migration	None - No access to site possible.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Yes	Species Captured-2016	NFC		Species Stage-2016	N/A		
Photo Comments								
<p>Broad floodplain with muddy wet areas, central narrow channel carrying flow currently. Isolated pools in sections.</p>								
Site Comments								
<p>Crossing site is located upstream of a barrier site found approximately 1 km downstream. Crossing is therefore rated as non-fish-bearing. Crossing is partially blocked at culvert inlet by beaver sticks, but is passing some water. Large deep pond is located upstream of blocked culvert, with abundant instream vegetation, mosses, algae. Amphibians abundant in pool, but no fish observed or captured during minnow trapping and electrofishing. Downstream channel section consists of small, minimally scoured channels and discontinuous pools. Multiple dewatered sections act as a barrier for fish passage. No fish access to site, non-fish-bearing.</p>								
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Sta 0+856	Structure No.
Watershed Code:	No data	Stream Order	1	
Stream Name	Unnamed	Stream Class	NVC	
Crew	IM, NN	UTM_Zone	09	UTM Northing 6025681
Survey Date	5/13/2016			UTM Easting 521594
Time	12:57:39	Site Length (m)	100	
Channel	No Visible Channel	Features	None	
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m) N/A
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate N/A
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover N/A
Water Quality	Temperature (Deg C)	No data	pH	No data
			Conductivity (uS/cm)	No data
				Turbidity
				No data
Riparian Vegetation			Crown Closure	N/A
Left Bank Shape	N/A		Right Bank Shape	N/A
Left Bank Texture	N/A		Right Bank Texture	N/A
Left Bank Riparian Vegetation	N/A		Right Bank Riparian Vegetation	N/A
Left Bank Stage	N/A		Right Bank Stage	N/A
Habitat Comments	Fish Species	N/A		
Spawning	N/A			
Rearing	N/A			
Overwintering	N/A			
Migration	N/A			
Fish Information	Historical Fish Presence	No data		
Fished -2015	No	Species Captured-2015	N/A	Species Stage-2015 N/A
Fished -2016	No	Species Captured-2016	N/A	Species Stage-2016 N/A
Photo Comments	Downstream undefined damp area.			
Site Comments	<p>No channel is present at crossing. Actual crossing site is sta 0+854. Culvert is 400 mm approx 6 m long corrugated steel pipe. Inlet is elevated above ditch bottom. Ditch located adjacent to road immediately upslope. Location confirmed by presence of flagged sta 0+854. Upslope of roadside ditch is very steep, approx 80-100%. Downstream of site has a low, broad, and undefined damp area with skunk cabbage and ferns. One small pool with stagnant water was observed 20 m downstream of crossing. No scour or channelization observed in this area. Possibly the very top of a drainage. No fish habitat or access potential at any time of year.</p>			
Notes:		Cover	Fish Species	Stream Class
N/A Assessed but no data to report		SWD Small woody debris	AS Atlantic salmon	Fish bearing
		LWD Large woody debris	CC Sculpins	S1 > 20 m
		B Boulder	CCT Coastal cutthroat trout	S2 > 5 m - 20 m
		UC Undercut bank	CH Chinook salmon	S3 1.5 m - 5 m
		DP Deep pools	CM Chum salmon	S4 < 1.5 m
		OV Overhanging vegetation	CO Coho salmon	
		IV Instream vegetation	CCG Slimy sculpin	
		DV Dolly varden	L Lamprey	
		PK Pink salmon	PL Pacific Lamprey	
		RB Rainbow trout	SA Salmon	
		SK Sockeye salmon	TSB Threespine stickleback	
				Non-fish bearing
				S5 > 3 m
				S6 < 3 m
				NVC No visible channel
				NCD Non-classified drainage
				NCD and wetlands are non-fish bearing except where noted.





# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Sta 7+640	Structure No.	
Watershed Code:	No data	Stream Order	1		
Stream Name	Unnamed	Stream Class	S6		
Crew	IM, NN	UTM_Zone	09	UTM Northing	6021624
Survey Date	5/14/2016			UTM Easting	522546
Time	09:48:56	Site Length (m)	100		
Channel	Visible channel	Features	CV - Culvert		
Mean Channel Width (m)	0.38	Mean Wetted Width (m)	0.00	Mean Residual Pool Depth (m)	0.00
Mean Gradient (%)	56	Dominate Substrate	Gravels	Sub-dominate Substrate	Cobbles
In-stream Cover	None	Dominant cover	N/A	Sub-dominant cover	N/A

Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
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Riparian Vegetation		Crown Closure	71-90%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Gravels	Right Bank Texture	Cobbles
Left Bank Riparian Vegetation	Mixedwood	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Mature Forest	Right Bank Stage	Mature Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	None - No fish access.	
Rearing	None - No fish access.	
Overwintering	None - No fish access.	
Migration	None - No fish access.	

Fish Information	Historical Fish Presence	No data
Fished -2015	Not visited	Species Captured-2015
Fished -2016	No	Species Captured-2016

Photo Comments	
50 m downslope of culvert, where steep slope channel becomes less well-defined.	

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Site Comments	
Culvert drains upslope ditch across road. Slope below outlet is very steep, approx 58%. Incised channel present for approx 50 m downslope of outlet. Beyond 50 m, stream becomes broad and undefined with no visible channel. Channel measurements are for 50 m section of channel between pipe outlet and undefined area downslope. Above culvert, only the roadside ditch is present, approx 1 m wide, 0.5 m deep.	



Notes:	Cover	Fish Species	Stream Class	
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.

# Terrace to Kitimat Transmission Project (TKTP)


## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Wedeeene FSR 2800			Structure No.		
Watershed Code:	No data		Stream Order	N/A				
Stream Name	Unnamed		Stream Class	NVC				
Crew	IM, HC, WM		UTM_Zone	09	UTM Northing	5995529		
Survey Date	7/6/2016				UTM Easting	521095		
Time	11:52:11		Site Length (m)	100				
Channel	Other		Features	None				
Mean Channel Width (m)	N/A	Mean Wetted Width (m)	N/A	Mean Residual Pool Depth (m)		N/A		
Mean Gradient (%)	N/A	Dominate Substrate	N/A	Sub-dominate Substrate		N/A		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	N/A	pH	N/A	Conductivity (uS/cm)	N/A	Turbidity	N/A
<b>Riparian Vegetation</b>			Crown Closure		N/A			
Left Bank Shape			N/A		Right Bank Shape			N/A
Left Bank Texture			N/A		Right Bank Texture			N/A
Left Bank Riparian Vegetation			N/A		Right Bank Riparian Vegetation			N/A
Left Bank Stage			N/A		Right Bank Stage			N/A
<b>Habitat Comments</b>	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
<b>Fish Information</b>	Historical Fish Presence	No data						
Fished -2015	No	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
<b>Photo Comments</b> Downstream of crossing site.								
<b>Site Comments</b> Crossing site consists of a downstream wetland area in a clearcut patch. No culvert could be found at the crossing site. Upstream drainage consists of ditch flow only, that drains to the south to a different culvert site. Drainage is a local depression in the wetland area with an undefined, muddy bottomed area. No water present. Further downstream, the drainage enters a forest. Overland flow evidence is visible, between low areas where water could pool. No evidence of channelization, no scour, no deposition. No fish habitat, non-fish bearing.								
<b>Notes:</b> N/A Assessed but no data to report	<b>Cover</b> SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	<b>Fish Species</b> AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<b>Stream Class</b> <u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.			

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Wedeeene FSR_122			Structure No.		
Watershed Code:	No data		Stream Order	1				
Stream Name	Unnamed		Stream Class	S4				
Crew	DF, NN		UTM_Zone	09	UTM Northing	6009773		
Survey Date	7/6/2016				UTM Easting	520501		
Time	16:30:00		Site Length (m)	100				
Channel	Visible channel		Features	None				
Mean Channel Width (m)	0.96	Mean Wetted Width (m)	0.58	Mean Residual Pool Depth (m)		0.04		
Mean Gradient (%)	4	Dominant Substrate	Fines	Sub-dominant Substrate		Gravels		
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover		LWD, SWD		
Water Quality	Temperature (Deg C)	10.0	pH	8.2	Conductivity (uS/cm)	67	Turbidity	C-Clear
Riparian Vegetation			Crown Closure		41-70%			
Left Bank Shape		Sloping	Right Bank Shape		Vertical			
Left Bank Texture		Fines	Right Bank Texture		Fines			
Left Bank Riparian Vegetation		Mixedwood	Right Bank Riparian Vegetation		Mixedwood			
Left Bank Stage		Mature Forest	Right Bank Stage		Mature Forest			
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Poor - Limited by small channel size and limited gravel availability within the study area. Only coarse substrate is found near the road.							
Rearing	Moderate - Limited pool habitat however high cover and close proximity to the Wedeeene River.							
Overwintering	Poor - Dry channel 40m upstream of the culvert. Limited pool habitat. Only suitable for juveniles.							
Migration	Moderate - No barriers observed. Dry channel further upstream may limit accessibility to habitat during low flow periods.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Yes	Species Captured-2016	CO		Species Stage-2016	Fry		
Photo Comments								
Upstream extent of surveyed area. Dry channel with isolated pools.								
Site Comments			<p>Channel flows alongside road in the ditch for approximately 35m. Channel is overgrown by shrubs and had gravel/cobble substrate. Further upstream the channel turns into the forest and becomes dry with isolated pools. Substrate here is entirely fine materials. Watercourse picks up some gravel from the road which is present just downstream of the culvert. Further downstream the bed material is primarily sand. Overhanging vegetation is the dominant cover throughout the study area. Watercourse discharges into the Wedeeene river approximately 100m downstream of the culvert.</p>					
Notes:	Cover	Fish Species	DV	Lamprey	Stream Class	Non-fish bearing		
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	PK Pink salmon	Fish bearing	S5 > 3 m		
	LWD Large woody debris	CC Sculpins	PL Pacific Lamprey	RB Rainbow trout	S1 > 20 m	S6 < 3 m		
	B Boulder	CCT Coastal cutthroat trout	SA Salmon	SK Sockeye salmon	S2 > 5 m - 20 m	NVC No visible channel		
	UC Undercut bank	CH Chinook salmon	TSB Threespine stickleback		S3 1.5 m - 5 m	NCD Non-classified drainage		
	DP Deep pools	CM Chum salmon			S4 < 1.5 m	NCD and wetlands are non-fish bearing except where noted.		
	OV Overhanging vegetation	CO Coho salmon						
	IV Instream vegetation	CCG Slimy sculpin						



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog


Prepared for BC Hydro


Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Wedeeene FSR_131			Structure No.		
Watershed Code:	No data		Stream Order	1				
Stream Name	Unammed		Stream Class	S3				
Crew	DF, NN		UTM_Zone	09	UTM Northing	6008077		
Survey Date	7/7/2016				UTM Easting	520275		
Time	14:39:04		Site Length (m)	100				
Channel	Visible channel		Features	None				
Mean Channel Width (m)	1.74	Mean Wetted Width (m)	1.06	Mean Residual Pool Depth (m)		0.15		
Mean Gradient (%)	1	Dominate Substrate	Fines	Sub-dominate Substrate		Gravels		
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover		SWD,IV		
Water Quality	Temperature (Deg C)	9.8	pH	7.8	Conductivity (uS/cm)	99	Turbidity	C-Clear
Riparian Vegetation			Crown Closure		41-70%			
Left Bank Shape		Sloping	Right Bank Shape		Undercut			
Left Bank Texture		Fines	Right Bank Texture		Fines			
Left Bank Riparian Vegetation		Deciduous	Right Bank Riparian Vegetation		Mixedwood			
Left Bank Stage		Young Forest	Right Bank Stage		Young Forest			
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Poor - No gravels. Substrates are primarily fine materials.							
Rearing	Good - Abundant cover and close proximity to the Wedeeene River. Limited pool habitat.							
Overwintering	Moderate - Shallow channel and limited pool habitat. Only suitable for juveniles.							
Migration	Good - Connectivity may be limited in low flow seasons as shallow areas may go dry. No other barriers observed.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	UNK		Species Stage-2016	Unknown		
Photo Comments								
Downstream extent where the channel widens and is filled with algae.								
Site Comments		<p>Upstream of the culvert the watercourse is isolated shallow pools that runs parallel to the road in the ditch. A wetland area drains into the channel that may provide fish habitat during high flow seasons. Some cobble and gravel substrate in the ditch but fine materials found elsewhere. Downstream of the culvert, the channel widens and flows over fine material substrate. High amount of algae growth in the wetted area provides abundant cover for fish. Multiple juvenile fish observed downstream of the culvert.</p>						
Notes:		Cover	Fish Species	DV	Stream Class	Non-fish bearing		
N/A Assessed but no data to report		SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing	S5 > 3 m		
		LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S6 < 3 m		
		B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	NVC No visible channel		
		UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NCD Non-classified drainage		
		DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD and wetlands are non-fish bearing except where noted.		
		OV Overhanging vegetation	CO Coho salmon	SA Salmon				
		IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon				
				TSB Threespine stickleback				

Terrace to Kitimat Transmission Project (TKTP)										Prepared for BC Hydro		
Freshwater Fish and Fish Habitat Catalog										Project No	VE52379	
										Date	28-Oct-16	

Crossing Type	Access Road	Site Number	Wedeeene FSR_150				Structure No.	
Watershed Code:	No data	Stream Order	1					
Stream Name	Unnamed	Stream Class	S4					
Crew	DF, NN	UTM_Zone	09	UTM Northing	6005435			
Survey Date	7/4/2016	UTM Easting	520435					
Time	12:41:22	Site Length (m)	100					
Channel	Visible channel	Features	None					
Mean Channel Width (m)	1.41	Mean Wetted Width (m)	0.93	Mean Residual Pool Depth (m)		0.12		
Mean Gradient (%)	6	Dominate Substrate	Gravels	Sub-dominate Substrate		Fines		
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover		LWD, SWD, DP		
Water Quality	Temperature (Deg C)	11.7	pH	7.9	Conductivity (uS/cm)	37	Turbidity	C-Clear
Riparian Vegetation			Crown Closure		41-70%			
Left Bank Shape		Sloping	Right Bank Shape		Undercut			
Left Bank Texture		Fines	Right Bank Texture		Fines			
Left Bank Riparian Vegetation		Mixedwood	Right Bank Riparian Vegetation		Mixedwood			
Left Bank Stage		Young Forest	Right Bank Stage		Young Forest			
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	Good - Small channel, however good pea-sized gravels for spawning both in channel and on side bars that are likely wetted during higher flow seasons.							
Rearing	Good - Pools found downstream of culvert provide good rearing habitat. Abundant cover.							
Overwintering	Moderate - Small channel size with limited deep pools. Only overwintering potential for juveniles.							
Migration	Good - No barriers within study area.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Yes	Species Captured-2016	NFC		Species Stage-2016	N/A		
Photo Comments								
<p><b>Site Comments</b></p> <p>Channel flows in an irregular wandering pattern downstream of the culvert with multiple side bars. Cover in this area is provided mainly by overhanging vegetation and small woody debris. Upstream of the culvert the channel flows in the ditch parallel to the road for approximately 50m. This section is straight and heavily overgrown by shrub species (trees cleared for road ROW). Further upstream the channel turns into the forest where the gradient increases and the morphology changes. Gradient measured to 30% however step pool morphology may still allow fish passage. This section is confined and the substrates consist of gravels and cobbles.</p>								
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Wedeeene FSR_174			Structure No.		
Watershed Code:	No data		Stream Order	1				
Stream Name	Unnamed		Stream Class	S3				
Crew	DF, NN		UTM_Zone	09	UTM Northing	6001828		
Survey Date	7/3/2016				UTM Easting	520685		
Time	15:40:26		Site Length (m)	100				
Channel	Visible channel		Features	None				
Mean Channel Width (m)	1.61	Mean Wetted Width (m)	1.29	Mean Residual Pool Depth (m)		0.11		
Mean Gradient (%)	3	Dominate Substrate	Gravels	Sub-dominate Substrate		Fines		
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover		SWD, B, DP, IV		
Water Quality	Temperature (Deg C)	10.7	pH	7.1	Conductivity (uS/cm)	61	Turbidity	C-Clear
<b>Riparian Vegetation</b>			Crown Closure		41-70%			
Left Bank Shape		Sloping		Right Bank Shape		Sloping		
Left Bank Texture		Fines		Right Bank Texture		Fines		
Left Bank Riparian Vegetation		Mixedwood		Right Bank Riparian Vegetation		Mixedwood		
Left Bank Stage		Young Forest		Right Bank Stage		Young Forest		
<b>Habitat Comments</b>	Fish Species	AO - All Salmonids						
Spawning	Poor - Gravels only found below culvert. High amount of sedimentation likely from road crossing creating a thin layer of fine materials on top of coarse materials.							
Rearing	Moderate - Some pool habitat. High amount of cover.							
Overwintering	Moderate - Lack of deep pool habitat however flows likely maintained year round. Only suitable for juveniles.							
Migration	Good - Culvert and road crossing may be a barrier. No other barriers observed.							
<b>Fish Information</b>	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Yes	Species Captured-2016	CCT		Species Stage-2016	Parr		
<b>Photo Comments</b> Downstream extent of study area.								
<b>Site Comments</b> Watercourse characteristics upstream and downstream vary considerably. Upstream - small, unconfined, uniform channel with little pool habitat. Substrate is primarily fines and gravels. A small wetland 20 m wide by 30 m long is just upstream of the culvert. Good cover among wetland sedges. Downstream - confined channel with slightly larger gradient. Substrate is gravel, cobble and boulder. More riffle/pool habitat. Gravel substrate dominant because it is present upstream and downstream. Fines is subdominant because of high amounts upstream of the culvert and moderate amounts below. Cobble and boulder are common downstream but not found upstream. Creek crossing underneath road has two culverts though majority of flow appears to be through the ground. May be a barrier.								
<b>Notes:</b> N/A Assessed but no data to report	<b>Cover</b> SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	<b>Fish Species</b> AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	<b>Stream Class</b> <u>Fish bearing</u> S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m	<u>Non-fish bearing</u> S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.			



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog


Prepared for BC Hydro


Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Wedeeene FSR_2793			Structure No.		
Watershed Code:	No data		Stream Order	1				
Stream Name	Unnamed		Stream Class	S4				
Crew	DF, NN		UTM_Zone	09	UTM Northing	6011645		
Survey Date	7/3/2016				UTM Easting	522493		
Time	12:00:09		Site Length (m)	100				
Channel	Dry Channel		Features	None				
Mean Channel Width (m)	1.31	Mean Wetted Width (m)	0.29	Mean Residual Pool Depth (m)		0.04		
Mean Gradient (%)	7	Dominate Substrate	Fines	Sub-dominate Substrate		Gravels		
In-stream Cover	Abundant	Dominant cover	SWD	Sub-dominant cover		LWD, OV		
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
<b>Riparian Vegetation</b>			Crown Closure	71-90%				
Left Bank Shape	Sloping		Right Bank Shape	Sloping				
Left Bank Texture	Fines		Right Bank Texture	Fines				
Left Bank Riparian Vegetation	Coniferous		Right Bank Riparian Vegetation	Coniferous				
Left Bank Stage	Young Forest		Right Bank Stage	Mature Forest				
<b>Habitat Comments</b>	Fish Species	AO - All Salmonids						
Spawning	Poor - Poor connectivity to salmonid-bearing streams. Only gravel/cobble substrate is from the road bed fill.							
Rearing	Poor - Channel becomes non-classified drainage upstream of culvert. Some areas may have pools at higher flows.							
Overwintering	None - Dry or very shallow channel.							
Migration	Poor - Poor connectivity between shallow pools. Dry channel upstream.							
<b>Fish Information</b>	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
<b>Photo Comments</b>								
Near the confluence of a slightly larger creek. Upstream photo shows woody debris filling/covering the channel.								
<b>Site Comments</b>								
Defined channel from culvert to another drainage approximately 40 m downstream from culvert. This section of channel is filled with woody debris from spacing which has collapsed into the channel. Channel is mostly dry with limited flow near the confluence. Upstream of the culvert there is 30m of defined channel before the drainage becomes a non-classified drainage. Some gravel and cobble likely from the road creates one side bar. Otherwise, the channel substrate is comprised of fine materials.								
<b>Notes:</b>	<b>Cover</b>	<b>Fish Species</b>	<b>Stream Class</b>					
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	DV Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m				
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m				
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m				
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m				
	OV Overhanging vegetation	CO Coho salmon	SA Salmon	Non-fish bearing				
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon	S5 > 3 m				
			TSB Threespine stickleback	S6 < 3 m				
				NVC No visible channel				
				NCD Non-classified drainage				
				NCD and wetlands are non-fish bearing except where noted.				

<h1>Terrace to Kitimat Transmission Project (TKTP)</h1> <h2>Freshwater Fish and Fish Habitat Catalog</h2>						Prepared for BC Hydro		
						Project No	VE52379	
						Date	28-Oct-16	

Crossing Type	Access Road	Site Number	Wedeeene FSR_2796		Structure No.			
Watershed Code:	910-665062-20282		Stream Order	2				
Stream Name	Unnamed		Stream Class	S3				
Crew	DF, NN	UTM_Zone	09	UTM Northing	6011321			
Survey Date	7/2/2016			UTM Easting	522025			
Time	15:50:45		Site Length (m)	100				
Channel	Visible channel		Features	C - Cascade or chute				
Mean Channel Width (m)	1.59	Mean Wetted Width (m)	0.94	Mean Residual Pool Depth (m)	0.11			
Mean Gradient (%)	11	Dominate Substrate	Fines	Sub-dominate Substrate	Fines			
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	LWD, SWD, UC			
Water Quality	Temperature (Deg C)	6.9	pH	6.5	Conductivity (uS/cm)	20	Turbidity	C-Clear
Riparian Vegetation			Crown Closure	71-90%				
Left Bank Shape		Sloping		Right Bank Shape		Sloping		
Left Bank Texture		Fines		Right Bank Texture		Fines		
Left Bank Riparian Vegetation		Coniferous		Right Bank Riparian Vegetation		Coniferous		
Left Bank Stage		Young Forest		Right Bank Stage		Young Forest		
Habitat Comments	Fish Species	AO - All Salmonids						
Spawning	None - No coarse alluvial substrates.							
Rearing	Poor - Many drops once section of stream surveyed. Some deep pools and overhanging vegetation provides cover.							
Overwintering	Poor - Only a few pools that may provide overwintering habitat.							
Migration	Poor - Beaver dam and many drops ranging from 0.8 to 2 m would greatly decrease ability for juveniles to migrate upstream.							
Fish Information	Historical Fish Presence	No data						
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	Yes	Species Captured-2016	NFC		Species Stage-2016	N/A		
Photo Comments								
<p>Downstream view of channel downstream of road.</p>								
<p><b>Site Comments</b></p> <p>Creek assessed up to 200 m checking for fish barriers. A beaver dam and several small drops were observed. Downstream of the culvert the channel is confined with steep valley walls. Upstream the valley walls are much lower and the creek is occasionally confined. Trees cut down for spacing are discarded into the creek completely covering the channel. Small beaver dam upstream of the culvert impounds a small amount of water. Upstream of this the channel is completely dry.</p>								
Notes:	Cover	Fish Species	DV	Stream Class	Non-fish bearing			
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Dolly varden	Fish bearing				
	LWD Large woody debris	CC Sculpins	L Lamprey	S1 > 20 m	S5 > 3 m			
	B Boulder	CCT Coastal cutthroat trout	PK Pink salmon	S2 > 5 m - 20 m	S6 < 3 m			
	UC Undercut bank	CH Chinook salmon	PL Pacific Lamprey	S3 1.5 m - 5 m	NVC No visible channel			
	DP Deep pools	CM Chum salmon	RB Rainbow trout	S4 < 1.5 m	NCD Non-classified drainage			
	OV Overhanging vegetation	CO Coho salmon	SA Salmon		NCD and wetlands are non-fish bearing except where noted.			
	IV Instream vegetation	CCG Slimy sculpin	SK Sockeye salmon					
			TSB Threespine stickleback					

# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Wedeeene FSR_2797			Structure No.		
Watershed Code:	No data		Stream Order	1				
Stream Name	Unnamed		Stream Class	NCD				
Crew	NN, JR, DF		UTM_Zone	09	UTM Northing	6011599		
Survey Date	7/3/2016				UTM Easting	522464		
Time	12:50:42		Site Length (m)	100				
Channel	Non-classified Drainage		Features	None				
Mean Channel Width (m)	No data	Mean Wetted Width (m)	No data	Mean Residual Pool Depth (m)		No data		
Mean Gradient (%)	No data	Dominate Substrate	Fines	Sub-dominate Substrate		Fines		
In-stream Cover	N/A	Dominant cover	N/A	Sub-dominant cover		N/A		
Water Quality	Temperature (Deg C)	No data	pH	No data	Conductivity (uS/cm)	No data	Turbidity	No data
Riparian Vegetation			Crown Closure		N/A			
Left Bank Shape		Sloping	Right Bank Shape		Sloping			
Left Bank Texture		Fines	Right Bank Texture		Fines			
Left Bank Riparian Vegetation		Coniferous	Right Bank Riparian Vegetation		Coniferous			
Left Bank Stage		Young Forest	Right Bank Stage		Young Forest			
Habitat Comments	Fish Species	N/A						
Spawning	N/A							
Rearing	N/A							
Overwintering	N/A							
Migration	N/A							
Fish Information	Historical Fish Presence		No data					
Fished -2015	Not visited	Species Captured-2015	N/A		Species Stage-2015	N/A		
Fished -2016	No	Species Captured-2016	N/A		Species Stage-2016	N/A		
Photo Comments								
Site Comments								
No scour, alluvials, and no continuous channel, some pockets of water.								
Notes:	Cover	Fish Species	DV	Dolly varden	Stream Class	Non-fish bearing		
N/A Assessed but no data to report	SWD Small woody debris	AS Atlantic salmon	L Lamprey	Lamprey	Fish bearing			
	LWD Large woody debris	CC Sculpins	PK Pink salmon	Pink salmon	S1 > 20 m	S5 > 3 m		
	B Boulder	CCT Coastal cutthroat trout	PL Pacific Lamprey	Pacific Lamprey	S2 > 5 m - 20 m	S6 < 3 m		
	UC Undercut bank	CH Chinook salmon	RB Rainbow trout	Rainbow trout	S3 1.5 m - 5 m	NVC No visible channel		
	DP Deep pools	CM Chum salmon	SA Salmon	Salmon	S4 < 1.5 m	NCD Non-classified drainage		
	OV Overhanging vegetation	CO Coho salmon	SK Sockeye salmon	Sockeye salmon		NCD and wetlands are non-fish bearing except where noted.		
	IV Instream vegetation	CCG Slimy sculpin	TSB Threespine stickleback	Threespine stickleback				



# Terrace to Kitimat Transmission Project (TKTP)

## Freshwater Fish and Fish Habitat Catalog

Prepared for BC Hydro

Project No VE52379

Date 28-Oct-16



Crossing Type	Access Road	Site Number	Wedeeene FSR_2873	Structure No.	
Watershed Code:	No data	Stream Order	1		
Stream Name	Unnamed	Stream Class	NCD		
Crew	DF, NN	UTM_Zone	09	UTM Northing	6000539
Survey Date	7/3/2016			UTM Easting	520515
Time	13:58:48	Site Length (m)	100		
Channel	Visible channel	Features	None		
Mean Channel Width (m)	0.91	Mean Wetted Width (m)	0.58	Mean Residual Pool Depth (m)	0.09
Mean Gradient (%)	2	Dominate Substrate	Gravels	Sub-dominate Substrate	Fines
In-stream Cover	Abundant	Dominant cover	OV	Sub-dominant cover	SWD

Water Quality	Temperature (Deg C)	12.9	pH	6.7	Conductivity (uS/cm)	19	Turbidity	C-Clear
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Riparian Vegetation		Crown Closure	1-20%
Left Bank Shape	Sloping	Right Bank Shape	Sloping
Left Bank Texture	Fines	Right Bank Texture	Fines
Left Bank Riparian Vegetation	Coniferous	Right Bank Riparian Vegetation	Mixedwood
Left Bank Stage	Young Forest	Right Bank Stage	Young Forest

Habitat Comments	Fish Species	AO - All Salmonids
Spawning	None - Fish barrier downstream would prevent fish from entering area. Small channel size and lack of pool habitat for holding.	
Rearing	None - Fish barrier downstream. Small channel with shallow depths. Dry in areas.	
Overwintering	None - Lack of depth and barrier downstream.	
Migration	None - Migration barrier downstream.	

Fish Information	Historical Fish Presence		No data		
Fished -2015	Not visited	Species Captured-2015	N/A	Species Stage-2015	N/A
Fished -2016	Yes	Species Captured-2016	NFC	Species Stage-2016	N/A

Photo Comments	
Non-classified drainage section approximately 50 m downstream from the culvert. Water flow subterranean and over land without scour or alluvial deposits.	

Site Comments	
Trees cleared on the upstream side of the culvert for about 30 m. Thick growth of shrubs in this area completely hides the channel. 50 m downstream the channel becomes dry, then widens and then becomes undefined. Flow upstream becomes subsurface flow. Subsurface flows extend approx 29 m before flowing at the surface again. Surface flow is over organic materials without defined banks or scour (non-classified drainage). This section extends at least another 30 m. The non-classified drainage and subsurface flow creates a fish barrier for all species. No fish captured.	



Notes:	Cover	Fish Species	Stream Class	
N/A Assessed but no data to report	SWD Small woody debris LWD Large woody debris B Boulder UC Undercut bank DP Deep pools OV Overhanging vegetation IV Instream vegetation	AS Atlantic salmon CC Sculpins CCT Coastal cutthroat trout CH Chinook salmon CM Chum salmon CO Coho salmon CCG Slimy sculpin	DV Dolly varden L Lamprey PK Pink salmon PL Pacific Lamprey RB Rainbow trout SA Salmon SK Sockeye salmon TSB Threespine stickleback	Fish bearing S1 > 20 m S2 > 5 m - 20 m S3 1.5 m - 5 m S4 < 1.5 m Non-fish bearing S5 > 3 m S6 < 3 m NVC No visible channel NCD Non-classified drainage NCD and wetlands are non-fish bearing except where noted.

## **Appendix B.3**

### **Fish Capture Data**

Site Number	Species Captured	Fork length (mm)				Weight (g)			
		n	Mean	SE	Range	n	Mean	SE	Range
TL2	RB	2	126	36	84 - 167	2	27.9	16.9	8.2 - 47.7
	CCT	1	75	-	-	1	4.4	-	-
TL3	CO	5	40	1	37 - 43	5	1.0	0.1	
	DV	2	30	2	28 - 32	2	0.6	0.2	0.4-0.8
	L	1	113	-	-	1	3.0	-	-
	CCT	1	106	-	-	1	117.0	-	-
TL6	CCT	2	63	0	63.0	1	3.7	-	-
TL17	CO	22	39	1	34 - 48	7	1.2	0.6	0.4 - 4.6
	DV	6	38	8	27 - 80	2	2.4	2.1	0.3 - 4.5
	CCT	2	134	66	68 - 200	1	3.5	-	-
TL19	CCT	4	84	15	54 - 121	3	8.8	3.3	3.3 - 14.6
	CO	5	44	3	34 - 50	4	1.1	0.3	0.5 - 1.9
TL26	RB	2	99	5	94 - 104	2	12.5	1.8	10.7 - 14.3
TL27	RB	1	96	-	-	1	10.9	-	-
TL29	RB	1	105	-	-	1	12.5	-	-
TL31	RB	3	83	14	38 - 110	3	7.9	4.1	2.6 - 16.1
TL32	UNK	1	40	-	-	0	-	-	-
RD158	RB	2	66.0	1.0	65 - 67	2	3.8	0.2	3.6 - 3.9
RD159	RB	3	91.7	3.3	87 - 98	1	3.7	-	-

**Species:** L = lamprey, CO = coho salmon, CCT = coastal cutthroat trout, DV = Dolly Varden,  
RB = rainbow trout

**Notes:** mm = millimetres, g = grams, n = number, SE = standard error