N12

N12

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Wolverine Lake OF	Survey Date (d/m/y): 05-Aug-10	Coordinates:	Coordinates:
SITE: N13	Survey Crew: MS/MT	DS? 434756/7547137	US 434791/7547278
Survey Distance (m)			

Temperature (°C):	Transparency: C	Comments
Channel Velocity (m/s):	Conductivity (uS/cm):	wetland, no flowing water
Current Flow Conditions:	pH:	Weather:
Discharge estimate (m^3/s)		high overcast, light cool breeze

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
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15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: _____

Rearing: _____

Adult Feeding: _____

Over-wintering: _____

Migration: _____

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: _____ **SITE:** N13 **DATE:** _____ **CREW:** _____

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1																
2																
3																
4																
5																
6																
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18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

NO CHANNEL- wetland
Pic 977 upstream?
Pic 972 downstream toward Wolverine Lake
Possible could shock standing water patches
No fish observed
No connections to larger water bodies (eg Wolverine Lake)

Data Entered ☐ **QA/QC** ☐

N13

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Wolverine Lake OF	Survey Date (d/m/y):	23-Jun-10	Coordinates:	Coordinates:
SITE:	N14	Survey Crew:	C. Martin, Irvin	434778/7547181	434751/7547064
Survey Distance (m)	200				

Temperature (°C):		Transparency:	
Channel Velocity (m/s):		Conductivity (uS/cm):	
Current Flow Conditions:		pH:	
Discharge estimate (m^3/s)			

Comments

more of a pond

Weather:

sunny and windy

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
															Depth (m)			
					min	max	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Max	Crest	Type	T/P
1	G?	0	200	<0.5	0.10	0.10	21.0	33.0	100	0	0	0	0					
2	middle (100m)				0.15	0.20	8.0	27.0	100	0	0	0	0					
3					0.10	0.20	6.0	15.0	100	0	0	0	0					
4																		
5																		
6																		
7																		
8																		
9																		
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17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: P

Rearing: G

Adult Feeding: P

Over-wintering: P

Migration: P

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Wolverine Lake OF **SITE:** N14 **DATE:** 23-Jun-10 **CREW:** C. Martin

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	S	S	0	0	95	0	0	0	0	102-0029	view downstream of sample reach			
2					0	0	95	0	0	0	0	102-0030	view of sample reach from upstream			
3					0	0	95	0	0	0	0	102-0031	view downstream of middle reach			
4												102-0032	view upstream of middle reach			
5												102-0033	view of sample reach from upstream			
6												102-0034	view of Wolverine Lake from upstreatm of r			
7																
8																
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14																
15																
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17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

Glide, maybe swamp

more swampy

very low water flow, but does exist in very narrow, defined channel

geese w/ orange beaks observed on shoreline of Wolverine Lake and Canada Geese

some off-channel still water

probably good YOY rearing (lots of veg. Cover and low flow), but likely dry soon

OVERALL

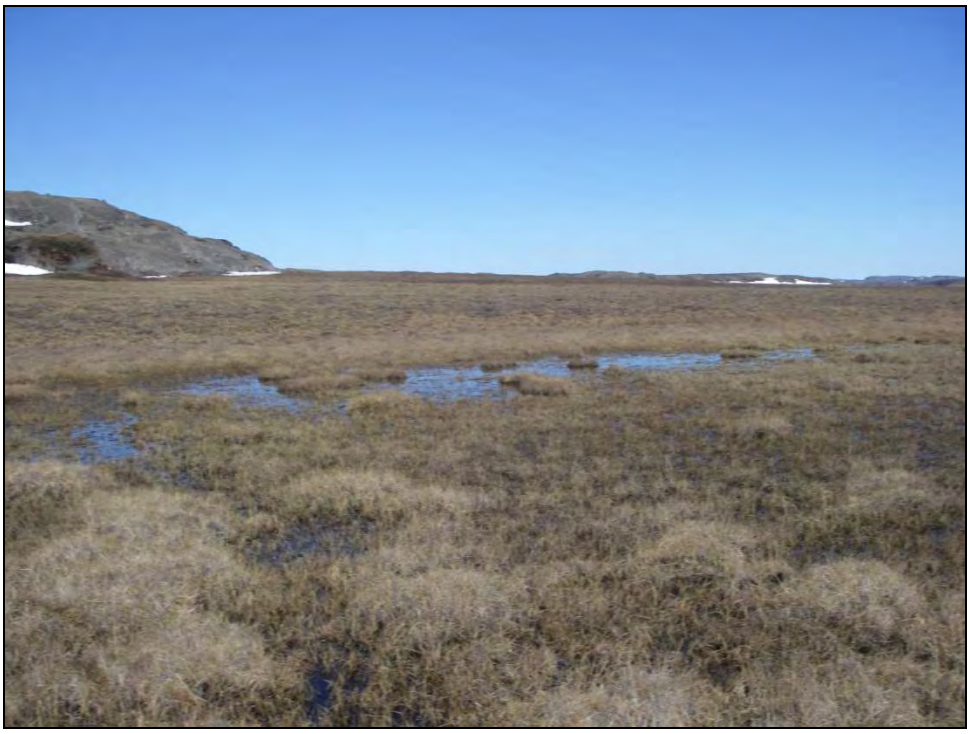
low habitat importance

little flow

no pools

very shallow with deep organic/fine sediments

Data Entered ☐ **QA/QC** ☐



N14

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	PO Inflow	Survey Date (d/m/y):	23-Jun-10	Coordinates:	Coordinates:
SITE:	N15	Survey Crew:	EG/BM	737820/7547265	
Survey Distance (m)	~200				

Temperature (°C):	11.1	Transparency:	clear	Comments	
Channel Velocity (m/s):		Conductivity (uS/cm):	162.6	no fish survey	
Current Flow Conditions:	high	pH:	7.23	Weather:	
Discharge estimate (m^3/s)		sal	71.2		
			119 tds	cool, sunny, light wind	

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
															Depth (m)			
					min	max	min	max	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Max	Crest	Type	T/P
1	R	0	10	0.5	0.25	0.45	2.8	8.5	100	0	0	0	0				N	
2	G	10	190	0.5	0.30	0.82	4.0	17.0	100	0	0	0	0				N	
3																		
4			transect 2		0.32	0.87	6.5	11	100	0	0	0	0				N	
5																		
6																		
7																		
8																		
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15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: poor

Rearing: fair

Adult Feeding: NA

Over-wintering: poor

Migration: fair

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: _____ **SITE:** N15 **DATE:** 23-Jun-10 **CREW:** EG/BM _____

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1					0	0	25	0	0	0	0	275-276		0	0	0
2																
3																
4																
5																
6																
7																
8																
9																
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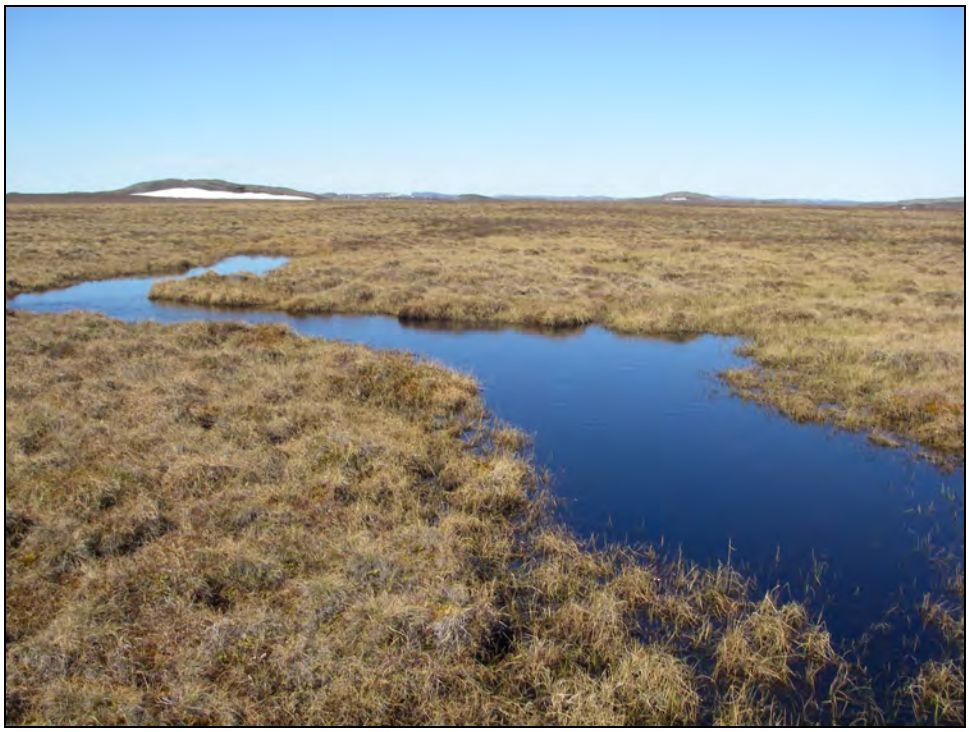
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

Data Entered ☐ **QA/QC** ☐



N15

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	PO outflow	Survey Date (d/m/y):	23-Jun-10	Coordinates:	Coordinates:
SITE:	N16	Survey Crew:	EG/BM	upstream 437779/7546438	downstream 437734/7546621
Survey Distance (m)	200				

Temperature (°C):	9	Transparency:	clear
Channel Velocity (m/s):		Conductivity (uS/cm):	192.2
Current Flow Conditions:	high	pH:	6.82
Discharge estimate (m^3/s)			80.5 sal

Comments

slow, meandering, low flow, few shallow pools only

Weather:

sunny, cool, light breeze

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
															Depth (m)			
					min	max	min	max	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Max	Crest	Type	T/P
1	G	0	173	0.5	0.40	0.80	12.0	16.0	100	0	0	0	0				N	
2																		
3	transects due to constant glide habitat																	
4				0.5	0.38	0.77	71	20	100	0	0	0	0				N	
5				0.5	0.20	0.57	11	24	100	0	0	0	0				N	
6																		
7	P	173	21	0.5	0.22	1.18	4.5	21	100	0	0	0	0	S	1.18	0.38	N	
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: poor

Rearing: fair

Adult Feeding: NA

Over-wintering: fair

Migration: good

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: PO inflow **SITE:** N16 **DATE:** June 23/2010 **CREW:** EG/BM

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1					0	0	20	0	0	0	0	268-270		0	0	0
2																
3																
4																
5																
6																
7																
8																
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13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments: *instream veg fluctuates along stream*

Data Entered ☐ **QA/QC** ☐

N16

N16

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: P.O. Lake Inflow | Survey Date (d/m/y): 23-Jun-10 | Coordinates: | Coordinates:
SITE: N17 | Survey Crew: C. Martin, Irvin | upstream 435460/7545606 | downstream 435587/7545729
Survey Distance (m)

Temperature (°C): 8
Channel Velocity (m/s):
Current Flow Conditions: moderate
Discharge estimate (m^3/s)

Transparency: high
Conductivity (uS/cm): 91.6
pH:

Comments
pools with wide glides and one riffle

Weather:
sunny and clear

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
															Depth (m)			
					Mean	max	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Max	Crest	Type	T/P
1	G	0	123	0.3	0.20	0.40	14.0	34.0	100	0	0	0	0					
2	P	123	33	0.3	0.45	0.80	15.0	31.0	100	0	0	0	0	U	0.80	0.3		
3	R	156	44	1.0	0.30	0.40	0.4	19.0	0	0	0	0	100					
4	P	181	195	0.0	0.30	0.65	0.65	46	85	0	0	0	15	U	0.65	0.3		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall
BF = Boulder Field, passage through the boulder arrangement is not possible for fish
D = dry channel, no stream flow
NC = no distinct channel, water drains over land
N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season
P = Permanent, all year round

Overall Rating:

Spawning: P
Rearing: G
Adult Feeding: G
Over-wintering: P
Migration: M

Data Entered ☐ QA/QC ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: P.O. Lake Inflow **SITE:** N17 **DATE:** June 23 2010 **CREW:** C. Martin

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1			S	S	0	0	70	0	0	0	0	103-0035	view downstream of sample reach to P.O Lake			
2			S	S	0	0	70	0	0	0	0	103-0036	view of sample reach from downstream			
3			S	S	0	0	30	0	0	0	0	103-0037	view of riffle from downstream			
4			S	S	0	0	85	0	0	0	0	103-0038	view of pool from upstream			
5												103-0039	2nd pool, assistant at 2nd stream			
6												103-0040	view of sample reach from upstream- note large pool on left			
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

GPS point 4004

Comments: ***permafrost***

wide, gentle flowing stream
pool fairly deep w/ lots of veg cover
saw one small fish (likely stickleback)
2nd pool at confluence of two streams
decent flows- good for fish- riffles/pool complex
flow near peak

OVERALL

critical
confluence of two streams which create deep pools
also riffle/glide/pool complexity
fish observed
lots of instream veg

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Stream crossing east of Wolverine Lake | Survey Date (d/m/y): 18-Sep-10 | Coordinates: 435450E/7545666N center of site | Coordinates:

SITE: N17 | Survey Crew: JG/BG

Survey Distance (m) 200

Temperature (°C): 3.9 | Transparency: clear

Channel Velocity (m/s): | Conductivity (uS/cm): 156.9

Current Flow Conditions: moderate ~1.5m/s | pH: 7.7

Discharge estimate (m^3/s):

Comments: shallow creek, poorly defined channel, very grassy (instream cover)

Weather: overcast/ no precip/ ~ 10km/h winds

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
															Depth (m)			
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Max	Crest	Type	T/P
1	G	0	200	1.5	0.30	0.40	20.0	32.0	100	0	0	0	0				NC/N	T/P
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
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18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: poor

Rearing: good

Adult Feeding: good

Over-wintering: poor

Migration: good to poor

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Potential stream crossing East of Wolverine Lake **SITE:** N17 **DATE:** 18/09/2010 **CREW:** JG/LK

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.10	0.05	H	H	0	0	95	0	0	0	0	142	very narrow channel	0	100	100
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

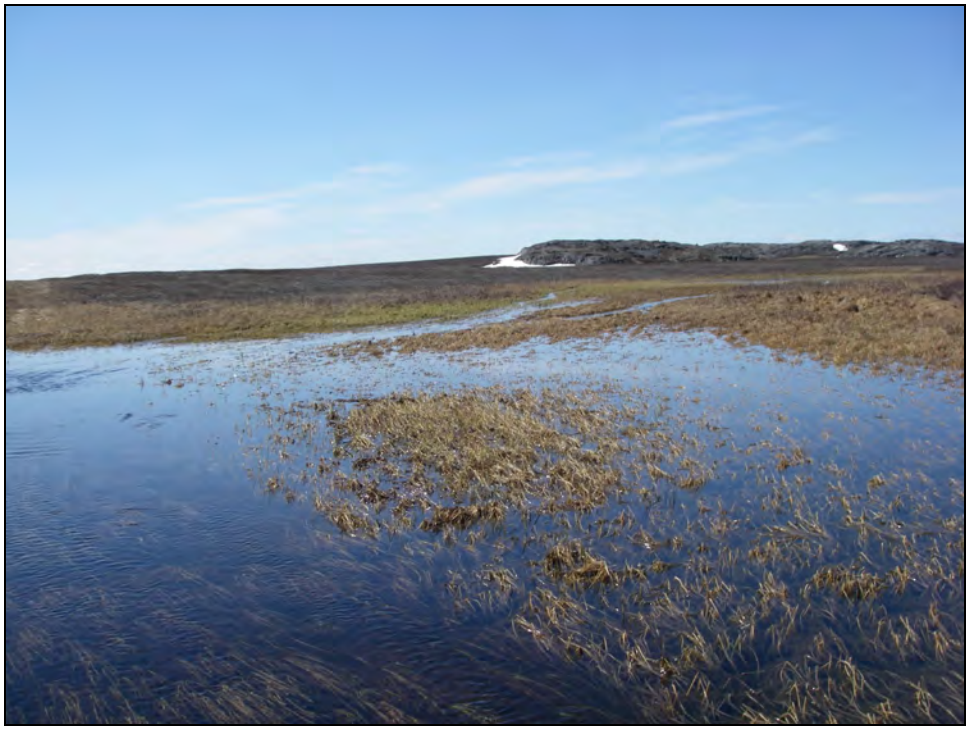
Comments:

flooded grass beside channel

~0.5 m define channel with average ~ 20m wetted

Data Entered ☐ **QA/QC** ☐

N17



N17

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:		Survey Date (d/m/y):	23-Jun-10	Coordinates:	Coordinates:
SITE:	N18	Survey Crew:	EG/BM	438352/7545523	
Survey Distance (m)	~200m				
				Comments	
Temperature (°C):	10.1	Transparency:	clear		
Channel Velocity (m/s):		Conductivity (uS/cm):	194.8		
Current Flow Conditions:		pH:	6.9	Weather:	
Discharge estimate (m^3/s)		138 ppm	82.6 sal		
				sunny, cool, light wind	

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
									Fines	Gravel	Cobble	Boulder	Bedrock		Depth (m)			
					min	max	min	max	(%)	(%)	(%)	(%)	(%)	Type	Max	Crest	Type	T/P
1	G	0	200	0.5	0.30	0.47	7.5	12.0	100	0	0	0	0				N	
2																		
3		transect 2			0.53	1.05	10.5	12.5	100	0	0	0	0				N	
4		transect 3			0.60	0.87	7	8									N	
5		transect 4			0.25	0.37	4.5	13	100	0	0	0	0				N	
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: poor

Rearing: fair

Adult Feeding: NA

Over-wintering: poor

Migration: good

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: _____ **SITE:** N18 **DATE:** June 23/10 **CREW:** EG/BM _____

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1					0.00	0.00	15.00	0	0	0	0	271 to 273		0	0	0
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

Data Entered ☐ **QA/QC** ☐

N18

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Koignuk River	Survey Date (d/m/y):	24-Jun-10	Coordinates:	Coordinates:
SITE:	N19	Survey Crew:	C. Martin	upstream W432760/7541603	downstream W432760/7541749
Survey Distance (m)	200				

Temperature (°C):	3.5	Transparency:	med
Channel Velocity (m/s):		Conductivity (uS/cm):	45
Current Flow Conditions:	high	pH:	
Discharge estimate (m^3/s)			

Comments: fast water, rapids

Weather: sunny and clear

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	C	0	200	3.0		4.00	18.0	18.0	0	0	0	50	50				high flows	
2																		
3																		
4																		
5																		
6																		
7																		
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16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: P

Rearing: P

Adult Feeding: P

Over-wintering: P

Migration: P (M with lower flow)

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Koignuk River **SITE:** N19 **DATE:** 24/06/2010 **CREW:** C. Martin

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	7.00	4.00	H	H								04-0110	sample reach from DS			
2												111	sample reach from DS			
3												112	view of lake downstream of sample reach			
4												113	view of sample reach from upstream			
5												114	view of river above sample reach			
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

bed material hard to see but likely boulders and bedrock
storing whitewater (impassable)
stretch of about 400m
too strong to measure depth of substrate content
temp and con taken from side pool at bottom of the reach

400 m streatch of whitewater-probably impassable during peak flows

GPS point 4005

Overall
low habitat improtant
fast water is deep granite canyon
likely important migration route with lower flows
no spawning potential

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Koignuk River	Survey Date (d/m/y):	08-Aug-10	Coordinates:	Coordinates:
SITE:	N19	Survey Crew:	MS/BG	432775/7541705	432762/7541511
Survey Distance (m)	180			downstream	

Temperature (°C):	15.8	Transparency:	C
Channel Velocity (m/s):	1.3	Conductivity (uS/cm):	60.2
Current Flow Conditions:	M	pH:	8.03
Discharge estimate (m^3/s)			

Comments

crossing at narrow canyon

Weather:

high cloud, sunny periods, warm south wind (moderate)

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	G	0	43	1.5	2.00	3.00	15.0	16.0	0	0	0	20	80					
2	R	43	60	2.0	1.50	2.00	10.0	15.0	0	10	10	10	70					
3	G	100	80	1.5	2.00	3.00	10.0	12.0	0	0	0	20	80					
4																		
5																		
6																		
7																		
8																		
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17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: fair

limited gravel, fast flows

Rearing: good

Adult Feeding: good

Over-wintering: good

Migration: good

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Koignuk R **SITE:** N19 **DATE:** 08/08/2010 **CREW:** MS/BG

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	1.00	2.00	H	H	70	30	0	0	0	0	0	1032-1035	bed rock canyon			
2	1.00	0.60	H	H	50	50	0	0	0	0	0	1036-9	rapids @ crossing			
3	1.50	1.00	H	H	50	50	0	0	0	0	0	1040	D deep glide			
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

deep fast flowing canyon, depths estimated by eye (safety reasons)
deep glides separated by rapids (habitat unit 2)
banks of channel down by ground estimate
OVERALL HABITAT: IMPORTANT
abundant rearing areas and good access to other habitat types upstream and downstream

Hab. Unit	Pic #	Direction
1	1032	D
1	1033	D
1	1034	D
2	1036	D
2	1037	U at crossing
2	1038	D (side channel at crossing)
2	1039	U (side channel at crossing)
3	1040	D

Data Entered ☐ QA/QC ☐

N19

N19

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:		Survey Date (d/m/y):	25-Jun-10	Coordinates:	Coordinates:
SITE:	C01	Survey Crew:	EG/EL	434992/7531138	
Survey Distance (m)	202			starting point (us)	

Temperature (°C):		Transparency:	moderate
Channel Velocity (m/s):		Conductivity (uS/cm):	150.5
Current Flow Conditions:	high	pH:	6.8
Discharge estimate (m^3/s)		sal	63.1
		105 tds	

Comments

at snow fence, high flow time

Weather:

overcast, cool, light wind

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
															Depth (m)			
					min	max	min	max	Fines/clay (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Max	Crest	Type	T/P
1	R	0	45	0.5	0.20	0.60	4.0	5.5	100	0	0	0	0				N	
2	P	42	40	0.5	0.25	1.50	27.0	6.0	100	0	0	0	0	S	>1	0.45	N	
3	G	82	120	0.5	0.15	0.95	7.0	9.5	100	0	0	0	0				N	
4																		
5																		
6																		
7																		
8																		
9																		
10																		
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16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: poor

Rearing: fair

Adult Feeding: no fish survey

Over-wintering: poor- no pools

Migration: fair

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: _____ **SITE:** C01 **DATE:** 26/06/2010 **CREW:** EG/EL

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1					0	0	5	0	0	0	0	141-146	walking downstream	0	0	0
2					95	0	5	0	0	0	0					
3					0	0	5	0	0	0	0					
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Mid Belt	Survey Date (d/m/y):	08-Aug-10	Coordinates:	Coordinates:
SITE:	C01	Survey Crew:	MS/BG	434893/7531138	435071/7531149
Survey Distance (m)				downstream	
Temperature (°C):	18.1	Transparency:	moderate	Comments	
Channel Velocity (m/s):	0.6	Conductivity (uS/cm):	231		
Current Flow Conditions:	M	pH:	7.75	Weather:	
Discharge estimate (m^3/s)				few clouds, sunny, hot	

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	R	0	30	0.5	0.50	1.00	2.0	10.0	40	50	15	5	0					
2	P	30	50	0.5	1.50	3.00	2.0	2.5	80	20	0	0	0	S	~2	0.5		
3	R	80	30	1.5	0.40	1.20	1.5	6.0	20	40	30	10	0					
4	P	110	10	1.0	0.50	1.30	2	8	20	40	30	10	0	S	0.60	0.2		
5	R	120	10	1.0	0.30	0.60	1.5	10	10	30	30	30	0					
6	G	130	80	0.5	0.60	1.30	7	14	10	30	30	30	0					
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: good

Rearing: good

Adult Feeding: good

Over-wintering: fair

some deep pools, might not freeze solid

Migration: G

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Mid belt **SITE:** C01 **DATE:** 08/08/2010 **CREW:** MS/BG

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.40	0.30	S	S	0	10	30	10	50	0	0	1045	U			
2	0.20	0.20	S	S	50	0	40	10	0	0	0	1046	U- young sticklebacks			
3	0.20	0.20	S	S	0	40	40	10	10	0	0	1047/8	U			
4	0.60	0.60	S	S	50	10	0	5	35	0	0	1049	U			
5	0.30	0.20	S	S	0	70	10	10	10	0	0					
6	0.40	0.30	S	S	0	30	30	10	30	0	0	1050/1	1050-U, 1051-D			
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

meandering warm stream, abundant rearing and some spawning habitat with good access to larger waterbodies
OVERALL habitat: IMPORTANT- depending on how much warm rearing habitat around

Data Entered ☐ **QA/QC** ☐

C01

C01

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: PND Rd Crossing NE of Aimaokatalok | Survey Date (d/m/y): 23-Jun-10 | Coordinates: 437643/7524600 (downstream) | Coordinates: 438? upstream

SITE: C02 (north fork) | Survey Crew: MS/HE/CK

Survey Distance (m): 200

Temperature (°C): ~10 (estimated by touch)

Channel Velocity (m/s):

Current Flow Conditions: H

Discharge estimate (m^3/s)

Transparency: C

Conductivity (uS/cm): 79

pH: 7.9

Comments: observed fish (Grayling Juvenile?) , assessed U and D of PND Rd Crossing

Weather: sunny light breeze warm

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
															Depth (m)			
					Mean	max	Mean	max	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Max	Crest	Type	T/P
1	G	0	200	0.5	0.20	0.70	13.0	15.0	100	0	0	0	0				N	
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: fair-limited gravel

Rearing: good-abundant cover

Adult Feeding: good

Over-wintering: good-lake headed

Migration: good- low gradient

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: NE of Aimaokatalok L PND RD Crossing **SITE:** C02 (north fork) **DATE:** June 23 2010 **CREW:** MS/CK/HE

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	H	H	0	0	50	0	50	0	0	172	upstream			
2												173	small mid channel			
3												174	downstream midsite			
4												175	upstream toward lake			
5												176	downstream @ top of site			
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments: *max depth mid-channel* _ *undercut banks in mid-channel*
habitat complexity probably will increase after freshet

OVERALL habitat: important: good rearing and migration habitat possibly some spawning

Classic grayling stream: observed 4 or 5 fish (possible grayling, adult and juvenile) during survey. Mid channel= max depth 0.5-0.7m verticle banks with shrub/grass cover
Current freshet flow covers ~ 7-8m of riparian on either side of deep mid-channel

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

D/S @ confluence w/ 1001, upstream end of site

LOCATION: PND Rd NE Aimaokatalok L
SITE: C02
Survey Distance (m)

Survey Date (d/m/y): 23-Jun-10
Survey Crew: MS/CK/HE

Coordinates: 437887/7524620
Coordinates: 437990/7524343

Temperature (°C): ~ 8 (estimated by touch)
Channel Velocity (m/s):
Current Flow Conditions: H
Discharge estimate (m^3/s)

Transparency: C
Conductivity (uS/cm): 57.1
pH: 7.3

Comments
assessed lower reach downstream of Xing, small swampy stream entering site 1001 at PND Rd

Weather
sunny, light breeze, warm

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
									Fines	Gravel	Cobble	Boulder	Bedrock		Depth (m)			
					Mean	max	Mean	max	(%)	(%)	(%)	(%)	(%)	Type	Max	Crest	Type	T/P
1	G	0	30	0.5	0.50	0.50	0.5	2.5	100	0	0	0	0					
2	P	30	5	0.5	1.00	1.50	2.0	2.5	100	0	0	0	0	S/D	1.50	0.5		
3	G	35	165	0.5	0.10	0.50	0.3	0.5	100	0	0	0	0					
4																		
5																		
6																		
7																		
8																		
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18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall
BF = Boulder Field, passage through the boulder arrangement is not possible for fish
D = dry channel, no stream flow
NC = no distinct channel, water drains over land
N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season
P = Permanent, all year round

Overall Rating:

Spawning: good (stickles)
Rearing: G
Adult Feeding: G
Over-wintering: fair
Migration: good

Data Entered ☐ QA/QC ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: NE Aimaokatalok on PND Rd. **SITE:** C02 **DATE:** 23-Jun-10 **CREW:** MS/CK/HE

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	H	H	0	0	20	60	20	0	0	177	D @ confluence			
2	0.00	0.00	H	H	70	0	20	0	10	0	0	178-179	U along PND RD, Deep pool (1.2m)			
3	0.00	0.00	H	H	0	0	50	40	10	0	0	180	D @ top of site			
4												181	D @ road crossing			
5												182/3	U @ crossing			
6																
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Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

Assessed reach downstream of Corssing
OVERALL habitat: Marginal for most species (Important for stickleback)
Lower Reaches
Difficult access to migration due to braided small channels and subsurface flow downstream of corssing but provides important flow into fish habitat downstream
Swampy channel flowing into streamm 1001; intermittent pools as deep as 1-1.5m. Observed nine-spine sticklebacks in the stream.
Abundant cover in undercut banks. Riparian = grasses and shrubs
Deep pools and riffles flowing over fines (See pic 183) @ crossing
Temperature estimated by touch ~ 8 degrees C

Data Entered ☐ **QA/QC** ☐

C02 (north fork)

C02 (north fork)

C02 (south fork)

C02 (south fork)

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Boston Area	Survey Date (d/m/y):	25-Jun-10	Coordinates:	Coordinates:
SITE:	C03	Survey Crew:	CM/IK	upstream W439235/7516589	W439098/7516550
Survey Distance (m)	200				

Temperature (°C):	7	Transparency:	high	Comments
Channel Velocity (m/s):		Conductivity (uS/cm):	58.2	
Current Flow Conditions:	med	pH:		Weather:
Discharge estimate (m^3/s)				overcast and windy

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
															Depth (m)			
					Mean	max	Mean	max	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Max	Crest	Type	T/P
1	R	0	14	0.2	0.45	0.65	2.4	4.1	0	0	20	60	20				N	
2	P	14	14	0.0	1.40		4.5	8.0	0	0	5	25	70	S	2.40	0.2	N	
3	P	28	18	0.0	0.75	1.35	3.5	8.0	0	0	20	0	80	S	1.35	0.3	N	
4	R	46	34	0.2	0.40	1.00	0.5	1.6	30	10	0	0	60				N	
5	P	80	7	0.0	0.45		1	2.3	25	0	5	0	70	S	0.50	0.2	N	
6	P	87	17	0.0	0.40		1.2	2.4	20	0	10	50	20	S	0.55	0.3	N	
7	C	104	25	9.0	0.45	0.50	1.7	2.1	0	0	5	20	70				IF	P
8	P	129	21	1.0	0.60		7	18	10	20	10	30	30	S	0.8	0.3	N	
9	P	160	18	1	0.45				50	0	5	10	30	S	0.6	0.25	N	
10	G	178	22	1	0.3	0.4	1.5	1.7	20	30	45	5	0				N	
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: M

Rearing: G

Adult Feeding: G

Over-wintering: M

Migration: P (cascade barrier)

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston Area **SITE:** C03 **DATE:** June 25 2010 **CREW:** CM

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	H	S	0	15	0	0	0	0	0	137	upstream of reach			
2	0.00	0.00	H	S	40	0	30	0	0	0	0	138	reach from upstream			
3	0.00	0.00	S	S	80	0	20	0	0	0	0	139	pool 1 from ds			
4	0.00	0.00	S	S	0	0	70	0	0	0	0	140	pool 2 from us			
5	0.00	0.00	S	S	0	20	70	0	0	0	0	141	scour pools 3 and 4 from DS			
6	0.00	0.00	H	H	0	10	40	0	0	0	0	142	view of cascade from DS			
7	0.00	0.00	H	H	40	5	0	0	0	0	0	143	pool below cascade from US			
8	0.00	0.00	H	S	20	2	30	0	0	0	0	144	pools below cascade from DS			
9	0.00	0.00	S	S	20	5	75	0	0	0	0	145	view of cascade from high ground			
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

GPS point 4006

Comments:

large impassable waterfall/cascade (102-0142)
complex habitat with pools connected by glides, riffles, cascades
according to map, road to corss right over cascade
during high flow, flow spills out, over pool edges into adjacent grass area
connection between large lake and small lake
cascade separates two long pool/glide/riffle habitats

overall: important
deep pools with complexity
but cascade separates two reaches
lake above and below
decent flow and spawning sediment

Data Entered ☐ **QA/QC** ☐

C03

C03

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:		Survey Date (d/m/y):	25-Jun-10	Coordinates:
SITE:	S03	Survey Crew:	CM/IK	upstream 441648/7510935
Survey Distance (m)	200			downstream 441631/7510845

Temperature (°C):	7	Transparency:	high
Channel Velocity (m/s):	low	Conductivity (uS/cm):	87.2
Current Flow Conditions:	high H2O	pH:	
Discharge estimate (m^3/s)			

Comments

Weather:

overcast and windy

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
									Fines	Gravel	Cobble	Boulder	Bedrock		Depth (m)			
					Mean	max	Mean	max	(%)	(%)	(%)	(%)	(%)	Type	Max	Crest	Type	T/P
1	G	0	11	0.0	0.50	0.75	0.3	50.0	100	0	0	0	0				N	
2	P	11	15	0.0	1.10		1.7	2.5	100	0	0	0	0	U	1.45	0.46	N	
3	G	26	157	1.0	0.40	0.65	0.3	13.0	100	0	0	0	0				N	
4	R	183	21	1.0	0.40	0.60	0.75	12	100	0	0	0	0				N	
5	P	204	6	0.0			1.7	8	100	0	0	0	0	U	1.30	0.3	N	
6																		
7																		
8																		
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20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: P

Rearing: G

Adult Feeding: M

Over-wintering: P

Migration: G

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston area **SITE:** S03 **DATE:** 25/06/2010 **CREW:** CM/IK

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	U	U	0	0	95	0	0	0	0	105-0115	upstream of sample reach			
2	0.00	0.00	U	U	0	0	95	0	0	0	0	157	view from top, looking down sample reach			
3	0.00	0.00	U	U	0	0	95	0	0	0	0	158	view upstream of riffle			
4	0.00	0.00	U	U	50	0	50	0	0	0	0	159	view of riffle and downstream			
5												160	view of pool and sample reach from DS			
6												161	view of stream DS of reach			
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

GPS point 4007

small lake flowing into larger lake
low lying plain between 2 rocky outcrops (700m access)
flow through grass-wetland
deep, defined channel in middle (though very narrow)
fringing grass along banks
chennel bed covered in grass as well
sveral large deep pools connected by glides and one or two riffles
fringing grass area can estend several metres
starts as wide wetland ("delta") and increasingly becomes more confined as move downstream

overall mod. Habitat quality
deep glides with pools and veg
connects two lakes

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	E of Aimaokatalok Lake	Survey Date (d/m/y):	21-Sep-10	Coordinates:	Coordinates:
SITE:	S03	Survey Crew:	JG/BG	441648E/7510935N	
Survey Distance (m)	100			center of reach	

Temperature (°C):	1.3	Transparency:	clear
Channel Velocity (m/s):		Conductivity (uS/cm):	100.3
Current Flow Conditions:	slow <1m/s	pH:	7.84
Discharge estimate (m^3/s)			

Comments

width of stream is 30cm but flooded area is ~ 140m wide

Weather:

scattered clouds, wind E 25 km/h

Hab Unit No.	Hab Type	Dist. fr start 0	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	G	0	131	2.0	0.30	0.30	0.3	0.4	100	0	0	0	0				N	T
2	P	131	7	2.0			1.2	2.0	100	0	0	0	0	S	1.50	0.2	N	T
3	G	138	11	2.0	0.80	1.00	0.3	0.4	100	0	0	0	0				N	T
4	P	159	8	2.0			2	2.5	100	0	0	0	0	S	1.00	0.2	N	T
5	G	167	33	2.0	0.30	0.30	0.2	0.25	100	0	0	0	0				N	T
6																		
7																		
8																		
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14																		
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17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: poor

Rearing: good

Adult Feeding: good

Over-wintering: poor

Migration: poor

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: East of Aimaokatalok Lake **SITE:** S03 **DATE:** 21/09/2010 **CREW:** JG/BG

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	S	S	0	0	30	0	0	0	0	209		0	100	100
2	0.00	0.00	S	S	100	0	20	0	0	0	0	210		0	100	100
3	0.00	0.00	S	S	0	0	80	0	0	0	0	210		0	100	100
4	0.00	0.00	S	S	100	0	30	0	0	0	0	211		0	100	100
5	0.00	0.00	S	S	0	0	80	0	0	0	0	212		0	100	100
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Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

no overwintering; heavy instream veg overall, gradient increases towards south outside of study reach ~ 200m DS

no banks, area flooded over ~ 140m with defined channel ~0.5 m on average

Data Entered ☐ **QA/QC** ☐

S03

S03

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Boston Area	Survey Date (d/m/y):	25-Jun-10	Coordinates:	Coordinates:
SITE:	S04	Survey Crew:	CM/IK	upstream 444282/7510291	downstream 444267/7510137
Survey Distance (m)	200				
Temperature (°C):	7	Transparency:	med-low	Comments	
Channel Velocity (m/s):		Conductivity (uS/cm):	45.4		
Current Flow Conditions:	high	pH:		Weather:	
Discharge estimate (m^3/s)				overcast and windy	

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	max	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	BG	0	200	2.0			32.0	43.0									N	
2																		
3																		
4																		
5																		
6																		
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Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: G

Rearing: G

Adult Feeding: G

Over-wintering: P

Migration: G

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston camp **SITE:** S04 **DATE:** 25/06/2010 **CREW:** CM

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	H	H	0	5	1	0	0	0	0	105-0165	view DS of reach			
2												166	view of reach from DS			
3												167	view DS of middle reach			
4												168	View US of middle reach			
5												169	view of sample reach from US			
6												170	view of stream above sample reach			
7																
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14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

large pool just downstream of reach, good rearing habitat
during low flows boulder garden may be impassable
some areas of slow moving water along edges
water too dangerous to get depth, at least 1.2 m depth (average)

OVERALL- critical
likely important migration route
spawning sediment
off-channel pools

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Mark's River	Survey Date (d/m/y):	11-Aug-10	Coordinates:	Coordinates:
SITE:	S04	Survey Crew:	MT/IK	044300/7510092	044329/750991
Survey Distance (m)	100			upstream	downstream

Temperature (°C):	18.2	Transparency:	clear
Channel Velocity (m/s):		Conductivity (uS/cm):	88.2
Current Flow Conditions:	low	pH:	7.35
Discharge estimate (m^3/s)			

Comments

Weather:

overcast, calm

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	R	0	53	1.5	0.42	0.92	23.0	23.0	0	20	20	80	0	S	68.00	55		
2	G	53	48	1.1	0.48	1.05	28.0	28.0	0	20	20	80	0	S	50.00	40		
3																		
4																		
5																		
6																		
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Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating: IMPORTANT

Spawning: fair

Rearing: excellent

Adult Feeding: fair

Over-wintering: fair

Migration: excellent

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Mark's River **SITE:** S04 **DATE:** 11/08/2010 **CREW:** MT/IK

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1			H	H	5	80	5	0	0	0	0			0	0	0
2			H	H	5	90	5	0	0	0	0			0	20	25
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

Data Entered ☐ **QA/QC** ☐

S04

S04

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Boston Outflow 3	Survey Date (d/m/y):	03-Sep-10	Coordinates:	Coordinates:
SITE:	S05	Survey Crew:	KE/CB	444194/7509155	
Survey Distance (m)	200			DS	

Temperature (°C):		Transparency:	clear
Channel Velocity (m/s):	NA	Conductivity (uS/cm):	153
Current Flow Conditions:	low	pH:	7.5
Discharge estimate (m^3/s)	NA	tds (ppm):	109

Comments

Bost 3, habitat site same as fish density site

Weather:

clear, sunny

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	R	0	3.5	1.0	0.13	0.20	1.2	1.5	70	0	0	30	0				N	
2	P	3.6	1	1.0	0.20	0.25	1.0	1.5	0	0	40	60	0	S	0.39	0.22	N	
3	R	4.6	30	1.0	0.16	0.20	0.6	1.0	100	0	0	0	0				N	
4	W	34.6	165.4	1.0	0.15	0.20	25	30	100	0	0	0	0				N	
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: _____

Rearing: _____

Adult Feeding: _____

Over-wintering: _____

Migration: _____

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: _____ **SITE:** S05 **DATE:** _____ **CREW:** _____

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.20	0.20	H	H	0	30	50	0	0	0	0	106-050/1	d/s section @ confluence, 051 looking US	0	0	0
2	0.20	0.20	H	H	10	20	10	0	10	0	0	106-052	small pool where ARGR captured	0	0	0
3	0.20	0.20	H	H	0	0	80	20	0	0	0			0	100	100
4	0.20	0.20	H	H	0	0	100	0	0	0	0	106-053	wetland area in US section	0	100	100
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

site is fish bearing with ARGR and NSSB captures by electrofishing
directly connected to larger river flowing into Spyder Lake eastern shore
all habitat is poor/marginal for ARGR
over habitat class= Marginal S4

For NSSB
Spawning: good, abundance of vegetation and slow moving water
Rearing: good, abundant cover
Adult: good
Over-wintering: poor, same depth in small pools
Migration: fair, migration may hindered by shallow wetland complex with abundant vegetation upstream of confluence with larger river

W=wetland

Data Entered ☐ **QA/QC** ☐

S05

S05

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston tailings #3 | Survey Date (d/m/y): 25-Jun-10 | Coordinates: | Coordinates:
SITE: S06 | Survey Crew: MS/CK | upstream 446248/7509300 | 446066/7509194
Survey Distance (m) 200

Temperature (°C): 4 (est) | Transparency: C | Comments
Channel Velocity (m/s): | Conductivity (uS/cm): 130.1 | located @ pond outlet @ NE end of tailings pond
Current Flow Conditions: | pH: | Weather:
Discharge estimate (m^3/s): | high broken cloud moderate breeze cool

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
															Depth (m)			
					Mean	max	Mean	max	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Max	Crest	Type	T/P
1	G	0	200	0.5	0.20	0.30	1.5	3.0	100	0	0	0	0					
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall
BF = Boulder Field, passage through the boulder arrangement is not possible for fish
D = dry channel, no stream flow
NC = no distinct channel, water drains over land
N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season
P = Permanent, all year round

Overall Rating:

Spawning: poor

Rearing: good (stickles)

Adult Feeding: good (stickles)

Over-wintering: poor (shallow, ????)

Migration: fair- braided wetlands ~access to pond upstream

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston Tailings **SITE:** S06 **DATE:** 25-Jun-09 **CREW:** MS/CK

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	H	H	0	0	100	0	0	0	0	200	D/S @ top of site			
2												221	US toward pond headwaters			
3																
4												222	US @ bottom of site			
5												223	DS @ bottom of site			
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

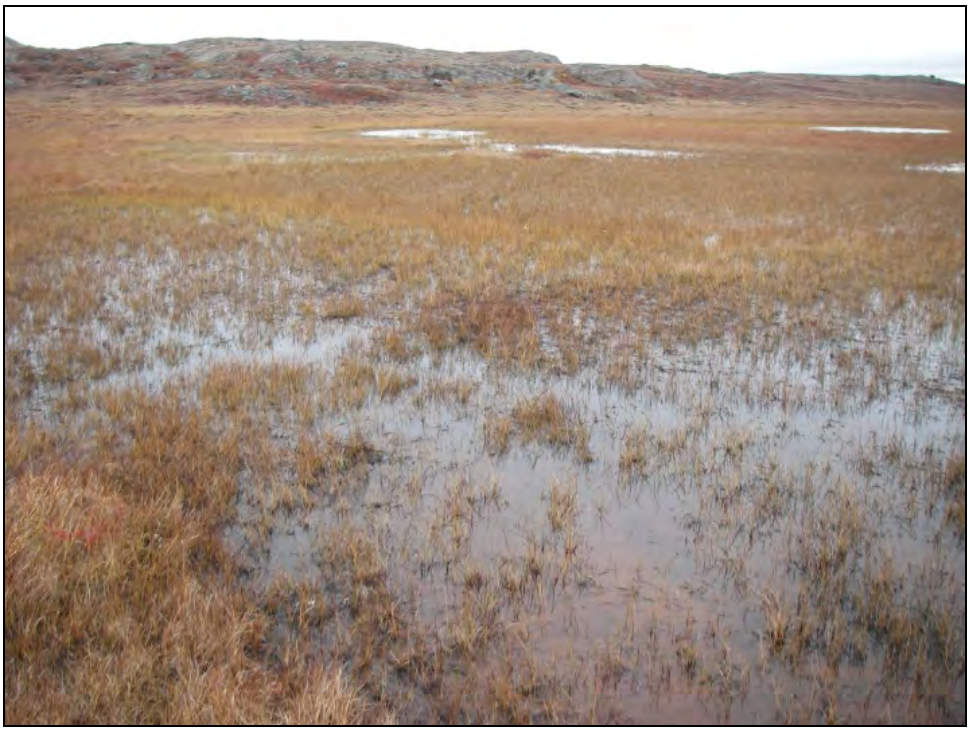
Comments:

OVERALL HABITAT: MARGINAL

shallow cool stream, limited or no access from downstream
good access to lake/pond upstream

assessed largest outflow of pond flowing toward tailings area,
slow flowing shallow drainage that breaks up into wetland and subsurface flow by 200m DS of pond
numerous other drainages (?????ride) in numerous locations within wetlands
no sign of fish
good spawning, rearing for stickleback

Data Entered ☐ **QA/QC** ☐



S06

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:		Survey Date (d/m/y):	25-Jun-10	Coordinates:	Coordinates:
SITE:	S07	Survey Crew:	MS/CK	444370/7508938	444481/7508846
Survey Distance (m)	230			downstream	

Temperature (°C):	10 (est. by touch)	Transparency:	C
Channel Velocity (m/s):	2 - riffle (max)	Conductivity (uS/cm):	89.3
Current Flow Conditions:		pH:	
Discharge estimate (m^3/s)			

Comments

start survey at weather station

Weather:

high overcast cool breeze

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
															Depth (m)			
					Mean	max	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Max	Crest	Type	T/P
1	R	0	2.5	0.5	0.10	0.30	1.2	1.2	100	0	0	0	0					
2	P	2.5	17	0.3	0.80	1.30	3.0	5.0	100	0	0	0	0	D/S	1.30	0.1		
3	R	19.5	11	2.0	0.30	0.30	1.0	1.0	100	0	0	0	0					
4	P	30.5	12	0.5	0.80	1.50	3	5	100	0	0	0	0	D/S	1.50	0.3		
5	R	42.5	15	1.0	0.30	0.60	0.8	4	100	0	0	0	0					
6	P	58	10	0.0	2.00	2.00	8	10	100	0	0	0	0	D/S	2.00	0.2		
7	R	68	86	2.0	0.10	0.20	0.4	0.6	100	0	0	0	0					
8	UG	154	46	0.0		0.10	18	20	100	0	0	0	0					
9	P	190	15	0.2	2	2	10	12	100	0	0	0	0	D/S	2	0.1		
10	R	205	9	0.5	0.3	0.2	0.5	2	100	0	0	0	0					
11	P	214	15	0.5	1.5	2	0.8	0.2	100	0	0	0	0	D/S	2	0.3		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: poor

Rearing: good

Adult Feeding: good

Over-wintering: good (deep pools)

Migration: good (downstream)

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston PND Rd **SITE:** S07 **DATE:** 25-Jun-10 **CREW:** MS/CK

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	H	H	0	0	90	0	10	0	0	210	single channel			
2					70	0	30	0	0	0	0	209	single channel			
3					0	0	70	0	30	0	0					
4					80	0	20	0	0	0	0					
5					0	0	80	0	20	0	0	211	braided channel			
6					80	0	20	0	0	0	0					
7					0	0	100	0	0	0	0	212	D braided			
8												213	U subsurface flow			
9																
10													braided riffle			
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments: *at PND RD2 pic 214 (downstream from chopper) and pic 215 (upstream from chopper)*

pics 209 D, 210 U

OVERALL HABITAT- important but migration upstream restricted by subsurface flow

Assessed 200 m section @ PND Road.
Most surface flow downstream towards confluence with large river
upstream reaches begin with braided riffle joining pools (deep pools) then further upstream riffles begin flowing subsurface.
Pools ramin deep but road tends to cross subsurface flow sections

Good rearing and migration to mainstem river. Limited or absence of gravel provides minimal spawning for salmonids

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: of Aimaokatalok Lak Survey Date (d/m/y): 21-Sep-10 Coordinates: 444370E/7508938N center of reach Coordinates:

SITE: S07 Survey Crew: JB/BG

Survey Distance (m) 200

Temperature (°C): 1.7 Transparency: clear

Channel Velocity (m/s): > 1m/s Conductivity (uS/cm): 179.4

Current Flow Conditions: M/H pH: 7.87

Discharge estimate (m^3/s)

Comments: high gradient/very deep pools 1.5-2m, well defined channel in shallow ravine, no bedrock

Weather: overcast/ wind E 20 km/h, no precip.

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	P	0	11	1.0			5.0	7.0	100	0	0	0	0	S	1.00	0.6	N	T
2	G	11	8	2.0	0.20	0.39	4.0	6.0	100	0	0	0	0				N	T
3	P	19	6	1.0			6.0	7.0	100	0	0	0	0	S	1.50	0.5	N	T
4	G	25	10	3.0	0.30	0.60	3.5	4	100	0	0	0	0				N	T
5	P	35	8	1.0			5	6	100	0	0	0	0	S	2.50	1	N	P
6	C	43	18	3.0	0.30	0.60	6	8	100	0	0	0	0				N	T
7	P	61	11	1.0			11	13	100	0	0	0	0	S	2.5	~1	N	P
8	G	72	10	3.4	0.30	0.60	11	12	100	0	0	0	0				N	T
9	P	82	12	1			12	14	100	0	0	0	0	S	2.5	1	N	P
10	G	94	13	2	0.25	0.5	4	5	100	0	0	0	0				N	T
11	P	107	10	1			12	13	100	0	0	0	0	S	2	1.5	N	P
12	G	117	6	3	0.2	0.5	1.5	4	100	0	0	0	0				N	T
13	P	123	20	1			5	6	100	0	0	0	0	S	1.2	0.75	N	T
14	G	143	12	5	0.15	0.35	1	8	100	0	0	0	0				IF	T
15	P	155	10	1			5	7	100	0	0	0	0	S	3	2	N	P
16	G	165	24	3.5	0.25	0.5	1.5	6	100	0	0	0	0				N	T
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: good

Rearing: excellent

Adult Feeding: good

Over-wintering: good

Migration: poor

too steep and too fast for

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: potential stream crossings **SITE:** S07 **DATE:** 21/09/2010 **CREW:** JG/BG

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.20	0.20	H	H	100	0	35	0	0	0	0	215		0	100	100
2	0.19	0.19	H	H	0	0	90	0	0	0	0	216		0	100	100
3	0.25	0.25	H	H	100	0	30	0	0	0	0	216		0	100	100
4	0.30	0.38	H	H	0	0	90	0	0	0	0	217		0	100	100
5	0.30	0.38	H	H	100	0	20	0	0	0	0	no pic		0	100	100
6	0.30	0.38	H	H	0	0	90	0	0	0	0	218		0	100	100
7	0.30	0.38	H	H	100	0	30	0	0	0	0	219		0	100	100
8	0.30	0.30	H	H	0	0	90	0	0	0	0	219		0	100	100
9	0.30	0.38	H	H	100	0	30	0	0	0	0	220		0	100	100
10	0.25	0.25	H	H	0	0	60	0	0	0	0	221		0	100	100
11	0.30	0.38	H	H	100	0	85	0	0	0	0	221		0	100	100
12	0.30	0.38	H	H	0	0	80	0	0	0	0	222		0	100	100
13	0.30	0.35	H	H	100	0	15	0	0	0	0	222		0	100	100
14	0.30	0.38	H	H	0	0	60	0	0	0	0	222		0	100	100
15	0.25	0.30	H	H	100	0	5 to 10	0	0	0	0	223		0	100	100
16	0.25	0.25	H	H	0	0	95	0	0	0	0	224		0	100	100
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

amazingly consistent pool/glide sequence
very deep pools and heavy instream veg
excellent cyprinid habitat although gradient and velocity might inhibit migration

Data Entered ☐ **QA/QC** ☐

S07

S07

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:		Survey Date (d/m/y):	25-Jun-10	Coordinates:	Coordinates:
SITE:	S09	Survey Crew:	MS	upstream 444210/7508103	downstream 444138/7508146
Survey Distance (m)					
				Comments	
Temperature (°C):		Transparency:	C		
Channel Velocity (m/s):		Conductivity (uS/cm):			
Current Flow Conditions:		pH:		Weather:	
Discharge estimate (m^3/s)					

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	G	0	200															
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
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15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: poor

Rearing: poor

Adult Feeding: poor

Over-wintering: poor

Migration: poor

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: _____ **SITE:** S09 **DATE:** 23-Jun-10 **CREW:** _____

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1												232	lake/pond margin			
2												233	downstream			
3												234	subsurface flow			
4												235	subsurface flow			
5												237				
6																
7												239	site from chopper upstream			
8												240	site from chopper downstream			
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

pics *OVERALL HABITAT: NO STREAM habitat= Lake margin ->wetland*

232-lakeshore

233-DS @lake *Water spills over lake then flows subsurface about 60m from lake. No channel flow probably dries soon after freshet and provides mirgration opportunities during freshet*

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: of Aimaokatalok Lak
SITE: S09
Survey Distance (m): 200
Survey Date (d/m/y): 21-Sep-10
Survey Crew: JG/BG
Coordinates: 444120E/7508103N center of reach
Coordinates:

Temperature (°C): 3.1
Channel Velocity (m/s): <0.5m/s
Current Flow Conditions: very low
Discharge estimate (m^3/s)
Transparency: clear
Conductivity (uS/cm): 143.7
pH: 8.08

Comments: poorly defined channel, very grown in with veg, close proximity to lake

Weather: overcast, wind SE 20km/h

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	G	0	120	1.5	0.15	0.28	1.0	2.0	100	0	0	0	0				N	T
2	P/lake	120	80	0.0	unknown	unknown	unknown	unknown	100	0	0	0	0	unknown	unknown	0.8	N	P
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
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16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall
BF = Boulder Field, passage through the boulder arrangement is not possible for fish
D = dry channel, no stream flow
NC = no distinct channel, water drains over land
N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season
P = Permanent, all year round

Overall Rating:

Spawning: poor
Rearing: good
Adult Feeding: good
Over-wintering: poor
Migration: good in spring, poor as of now

Data Entered ☐ QA/QC ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: East of Boston camp ~4.5m
East of Aimaokatalok Lake

SITE: S09

DATE: 21/09/2010

CREW: JG/BG

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.10	0.10	S	S	0	0	90	0	0	0	0	213	poor defined channel~1m width	0	100	100
2	0.30	0.30	H	H	100	0	10	0	0	0	5	214	woody debris present along shoreline	0	100	100
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

site is very close to shoreline of lake (@outflow)
heavy vegetated stream with lots of instream cover
variable depth in stream from <0.10m to ~0.30m
very low flow <0.5 m/s

Data Entered ☐ **QA/QC** ☐

S09

S09

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Boston 2 Aimaokatalok IF	**Survey Date (d/m/y):**	05-Sep-10	**Coordinates:**	**Coordinates:**
SITE:	S10	**Survey Crew:**	JG/CB	443017/7507143	443159/7507107
Survey Distance (m)	200			downstream	upstream

Temperature (°C):	8.5	**Transparency:**	clear water
Channel Velocity (m/s):		**Conductivity (uS/cm):**	81.1
Current Flow Conditions:	continuous	**pH:**	7.46
Discharge estimate (m^3/s)			

Comments

narrow stream (<5m wide on average), Boston 2

Weather:

overcast, 8km/h, wind west, ~8 degrees C, scattered showers

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	G	5	5	2.5	0.20	0.40	3.2	3.8	10	0	85	5	0					P
2	P	6	2	2.5			2.8	3.2	10	81	2	2	0	D	0.60		N	P
3	G	8	50	2.5	0.25	0.35	4.0	6.0	80	5	10	5	0				N	P
4	P	58	12	1.0	1.50	2.00	10	14	90	10	0	0	0	S	1.70		N	P
5	R	70	10	4.0	0.30	0.58	5.6	9.6	100	0	0	0	0				IF	P (small fish barrier)
6	P	80	7	1.0	0.70	1.60	3	5.6	100	0	0	0	0	S	0.80		N	P
7	G	87	14	2.5	0.25	0.36	4	5.5	100	0	0	0	0				N	P
8	P	101	25	1.0	0.70	2.20	7	9	95	0	0	0	0	S/D	1.8		N	P
9	G	126	4.5	1	0.3	0.6	4	12	100	0	0	0	0				N	P
10	P	130.5	17	1	0.9	2.3	13	15	100	0	0	0	0	S/D	1.9		N	P
11	R	147.5	16	3.5	0.2	0.35	3.2	4.5	100	0	0	0	0				N	P
12	P	163.5	11	1	0.6	0.7	6	7.5	100	0	0	0	0	S	0.6		N	P
13	G	174.5	25.5	2	0.25	0.6	7.2	8.2	100	0	0	0	0				N	P
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: not likely for adults/likely cyprinids

Rearing: yes Arctic grayling/NSSB

Adult Feeding: unsure ?/ probably

Over-wintering: no, poor depths

Migration: not in fall, maybe early summer

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston 2 **SITE:** S10 **DATE:** 05/09/2010 **CREW:** JG/CB

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.20	0.30	S	S	0	5	5	5	5	0	0			0	0	5
2	0.50	0.10	S	S	10	2	0	0	2	0	0			0	2	20
3	0.35	0.10	S	S	0	5	0	5	0	0	0			0	100	100
4	0.75	0.15	S	S	10	0	10	0	0	0	0			0	100	100
5	0.40	0.30	S	S	0	0	80	0	0	0	0			0	100	100
6	0.20	0.40	S	S	20	0	10	0	0	0	0			0	100	100
7	0.29	0.29	S	S	0	0	60	0	0	0	0			0	100	100
8	0.20	0.30	S	S	20	0	10	0	0	0	0			0	100	100
9	0.20	0.30	S	S	0	0	70	0	0	0	0			0	100	100
10	0.40	0.40	S	S	0	0	5	0	0	0	0			0	100	100
11	0.15	0.15	S	S	0	0	60	0	0	0	0			0	100	100
12	0.30	0.30	S	S	10	0	10	0	0	0	0			0	100	100
13	0.25	0.15	S	S	0	0	50	0	0	0	0		actual end length of glide is ~50m from point 174.5	0	100	100
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

Notes: Directly connected to Aimaokatalok Lake on east shore, classification= S4 (<1.5 w/ fish), (possible S3 in summer)

DFO classification: important

Camera not working

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	**Boston PND Road Crossing**	**Survey Date (d/m/y):**	**24-Jun-10**	**Coordinates:** upstream 443521/7506971
	SITE: S11	**Survey Crew:**	MS/CT	**Coordinates:** downstream 443343/7507053
	Survey Distance (m)			

Temperature (°C):	~10	**Transparency:**	C
Channel Velocity (m/s):	1	**Conductivity (uS/cm):**	36.5
Current Flow Conditions:	H	**pH:**	
Discharge estimate (m^3/s)			

Comments

Weather:

warm sunny light breeze

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers		RB
					Mean	max	Mean	max	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P	%
1	P	0	10	0.5	1.00	1.00	10.0	13.0	100	0	0	0	0		1.00	0.3			
2	G	10	23		0.30	0.40	5.0	8.0	100	0	0	0	0						
3	P	33	20		1.50	1.50	15.0	20.0	100	0	0	0	0		1.50	0.4			
4	G	53	5		0.30	0.30	3	3	100	0	0	0	0						
5	P	58	12		0.90	2.20	8	12	100	0	0	0	0		2.20	0.3			
6	R	70	8		0.30	0.60	1	1.2	100	0	0	0	0						
7	P	78	10		0.80	2.50	14	16	100	0	0	0	0		2.5	0.3			
8	R	88	8		0.20	0.30	0.8	0.8	100	0	0	0	0						
9	P	96	20		1.5	2.5	8	13	100	0	0	0	0		2.5	0.2			
10	R	116	4		0.3	0.3	1.2	1.2	100	0	0	0	0						
11	P	120	2		1	1.2	1.8	2	90	10	0	0	0		1.2	0.3			
12	R	122	10		0.3	0.4	0.8	1.2											
13	P	132	14		0.4	0.8	5	8							8	0.3			
14	R	146	17		0.3	0.8	0.5	0.9											
15	P	163	14		0.5	0.8	7	9							0.8	0.5			
16	R	177	12		0.4	0.4	1	1.5											
17	P	189	10		0.8	1.4	7	8											
18																			
19																			
20																			

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: fair- limited gravel

Rearing: good

Adult Feeding: good

Over-wintering: good- deep pools

Migration: good- DS to lake

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston **SITE:** S11 **DATE:** 24-Jun-10 **CREW:** MS/C

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	H	H	85		10	5				202	D @ bottow of site			
2	0.00	0.00					90	5	5			203	U @ bottom of site			
3					80		10		10			204	D@ top of site			
4							90	5	5			205	D= riffle/pool			
5					80		10	5	5			206	D=pool+glide			
6							80		20							
7					80		20									
8							80		20							
9					80		20									
10							80		20							
11					80		20									
12							80		20							
13					80		20									
14							80		20							
15					60		40									
16							80		20							
17					80		20									
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

OVERALL habitat: important- good rearing, possibly some spawning (limited gravel)

classic grayling stream (observed one fish ~ grayling?)

many deep pools separated by shallow riffle or glide.

Abundant instream vegetation provide cover together with periodic vertical or undercut banks in riffles and glides

sparce gravel, almost all fines substrate provide little spawning but abundant rearing and good migration downstream to lake

**migration limited further upstream because stream goes subsurface*

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Boston	Survey Date (d/m/y):	11-Aug-10	Coordinates:	Coordinates:
SITE:	S11	Survey Crew:	MT/IK	443381/7507015	443316/7507075
Survey Distance (m)	100				

Temperature (°C):	16.2	Transparency:	
Channel Velocity (m/s):		Conductivity (uS/cm):	151
Current Flow Conditions:	low	pH:	6.92
Discharge estimate (m^3/s)			

Comments

pools connected by grassy channel

Weather:

overcast, calm

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	P	0	23	0.0	1.00	1.50	22.0	25.0	100	0	0	0	0	S	2.00	0.2	N	
2	G	23	26	0.1	0.25	0.75	0.7	16.0	100	0	0	0	0				N	
3	O	49	19	0.0	1.00	1.50	13.0	17.0	100	0	0	0	0	S	2.00	0.8	N	
4	U	68	14	0.1	0.20	0.70	13	14	100	0	0	0	0				N	
5	P	82	2	0.0	0.30	0.80	9	11	100	0	0	0	0	S	0.40	0.15	N	
6	G	84	16	0.5	0.25	0.75	10	10	100	0	0	0	0					
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: poor

Rearing: fair

Adult Feeding: poor

Over-wintering: fair

Migration: poor

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston **SITE:** S11 **DATE:** 11/08/2010 **CREW:** MT/IK

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.50	1.00	HS	HS	100	0	70	0	0	0	0			0	80	80
2	0.50	0.50	HS	HS	0	0	90	0	0	0	0			0	10	50
3	0.50	0.50	HS	HS	100	0	70	0	0	0	0			0	30	20
4	0.50	0.50	HS	HS	0	0	90	0	0	0	0			0	40	40
5	0.50	0.50	HS	HS	100	0	30	0	0	0	0			0	100	40
6	0.60	0.50	HS	HS	0	0	90	0	0	0	0			0	80	80
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

fair stickleback habitat, poor otherwise

Data Entered ☐ **QA/QC** ☐

S11

S11

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Boston	Survey Date (d/m/y):	25-Jun-10	Coordinates:	Coordinates:
SITE:	S12	Survey Crew:	MT/CM/CB	444790/7506730	
Survey Distance (m)	228				

Temperature (°C):		Transparency:	clear
Channel Velocity (m/s):		Conductivity (uS/cm):	30
Current Flow Conditions:	H	pH:	6.8
Discharge estimate (m^3/s)			

Comments

GPS not working

Weather:

partly sunny, high broken clouds

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	G	100	100	0.1	0.20	0.30	4.0	5.0	100	0	0	0	0					
2	P	111	11	0.1	0.30	0.40	6.0	6.0	100	0	0	0	0	U	0.50	0.2		
3	G	145	34	0.1	0.20	0.30	11.0	12.0	100	0	0	0	0					
4	P	158	13	0.1	0.40	0.50	6	7	100	0	0	0	0	U	0.60	0.2		
5	P	190	32	0.1	0.40	0.50	11	11	100	0	0	0	0	U	0.50	0.2		
6	G	228	38	0.1	0.20	0.30	2	2	100	0	0	0	0					
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating: POOR

Spawning: poor

Rearing: fair

Adult Feeding: poor

Over-wintering: poor

Migration: poor

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston **SITE:** S12 **DATE:** 24/06/2010 **CREW:** MT/CM

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.10	0.10	S	S	0	0	90	0	0	0	0	288/289				
2	0.10	0.10	S	S	100	0	100	0	0	0	0	290	pool is natural depression			
3	0.10	0.10	S	S	0	0	100	0	0	0	0	291-292				
4	0.10	0.10	S	S	100	0	100	0	0	0	0	293	pool is natural depression			
5	0.10	0.10	S	S	100	0	95	0	0	0	0	294				
6	0.10	0.10	S	S	100	0	90	0	0	0	0	295				
7																
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9																
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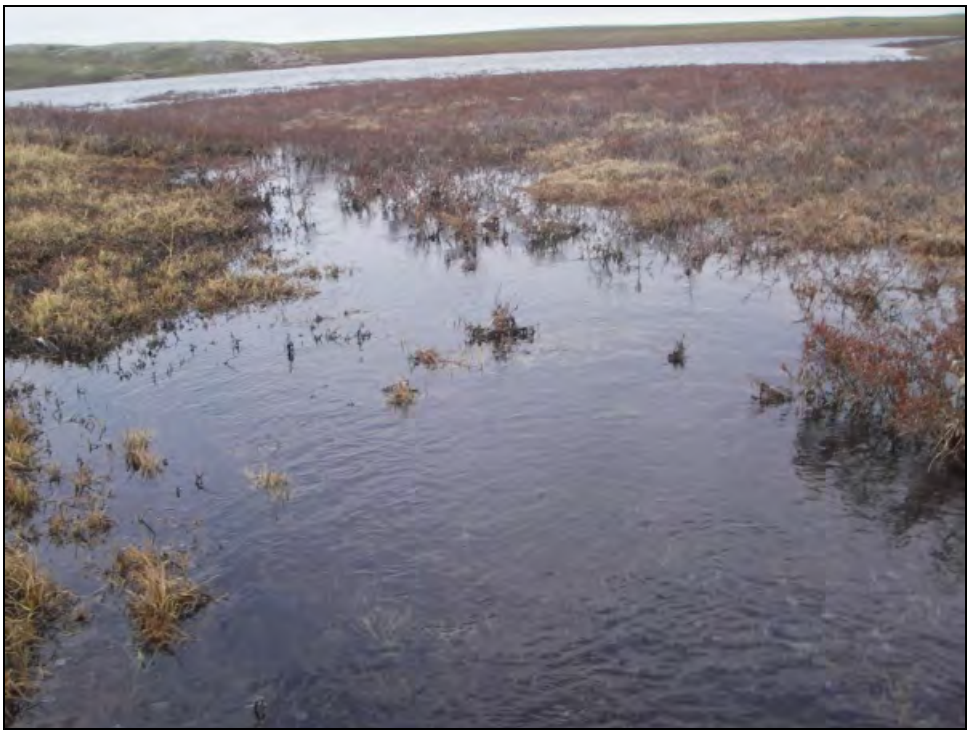
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

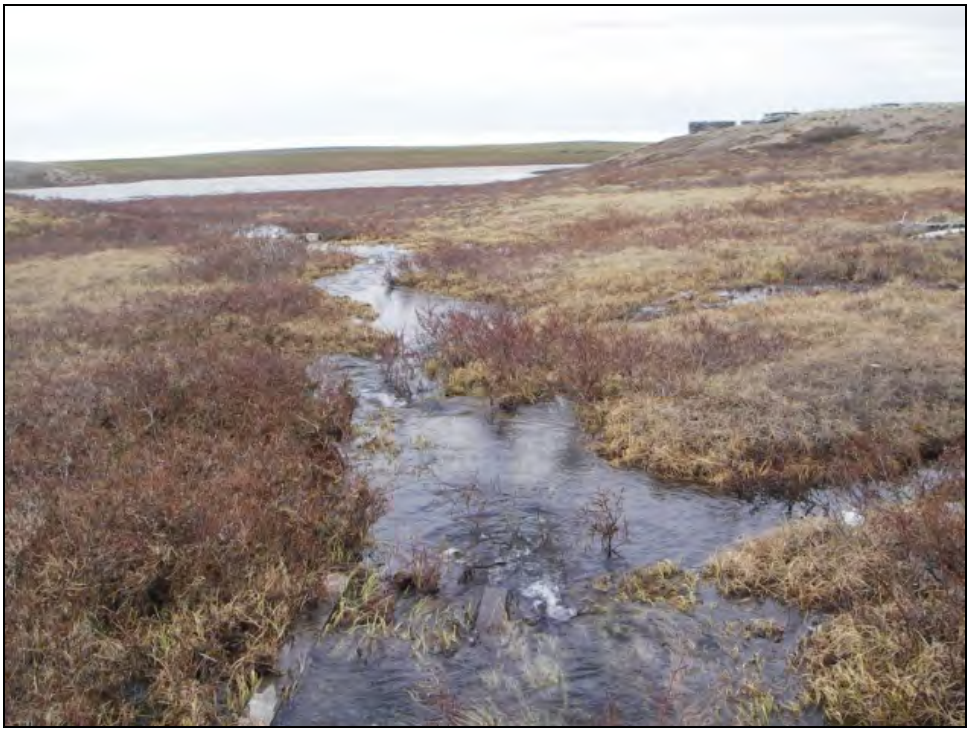
Comments:

small grassy stream draining snow melt from the shadow of an esker
not good fish habitat
no fish observed

Data Entered ☐ **QA/QC** ☐



S12



S12

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Boston	Survey Date (d/m/y):	25-Jun-10	Coordinates:	Coordinates:
SITE:	S13	Survey Crew:		444850/7506280	
Survey Distance (m)					

Temperature (°C):		Transparency:	clear
Channel Velocity (m/s):		Conductivity (uS/cm):	40
Current Flow Conditions:	H	pH:	
Discharge estimate (m^3/s)			

Comments

GPS not working

Weather:

high clouds

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	P	5	5	0.1	0.60	0.70	4.0	5.0	100	0	0	0	0	S	0.80	0.2		
2	G	51	46	0.1	0.20	0.30	10.0	11.0	100	0	0	0	0					
3	P	61	10	0.1	0.40	0.50	6.0	9.0	100	0	0	0	0	S	0.70	0.2		
4	G	211	150	0.1	0.10	0.20	40	40	100	0	0	0	0					
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating: POOR

Spawning: poor

Rearing: poor

Adult Feeding: poor

Over-wintering: poor

Migration: poor

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: _____ **SITE:** S13 **DATE:** _____ **CREW:** _____

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.10	0.10	S	S	100	0	20	0	0	0	0	296-297				
2	0.10	0.10	S	S	0	0	80	0	0	0	0	298-300				
3	0.10	0.10	S	S	0	0	80	0	0	0	0	301-302	braided channel->wetlands			
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

Just a trickle draining a wetland fed by snow melt from a large snowbank in the shadow of an esker

Data Entered ☐ **QA/QC** ☐

S13

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Boston	Survey Date (d/m/y):	26-Jun-10	Coordinates:	Coordinates:
SITE:	S14	Survey Crew:	MT/CM/CB	444450/7506040	
Survey Distance (m)					
Temperature (°C):		Transparency:		Comments	
Channel Velocity (m/s):		Conductivity (uS/cm):		GPS not working	
Current Flow Conditions:	H	pH:		Weather:	
Discharge estimate (m^3/s)				overcast	

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	G	0	85	0.1	0.30	0.40	4.0	6.0	100	0	0	0	0					
2	P	85	25	0.1	0.50	0.60	10.0	10.0	100	0	0	0	0		0.60	0.3		
3	G	110	40	0.1	0.30	0.40	4.0	10.0	100	0	0	0	0					
4	G	150	50	0.1	0.50	0.70	10	11	100	0	0	0	0					
5																		
6																		
7																		
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9																		
10																		
11																		
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13																		
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16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating: poor

Spawning: poor

Rearing: fair

Adult Feeding: poor

Over-wintering: poor

Migration: fair

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston **SITE:** S14 **DATE:** 25/06/2010 **CREW:** MT/CM

	Banks of Channel				Instream Cover									Riparian Cover		
Hab Unit No.	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %	Photos #	Comments	Canopy %	LB %	RB %
1	0.10	0.10	5	5	0	0	85	0	0	0	0	280-283				
2	0.10	0.10	5	5	100	0	20	0	0	0	0	284				
3	0.10	0.10	5	5	0	0	95	0	0	0	0	285				
4	0.10	0.10	5	5	0	0	40	0	0	0	0	286-287				
5																
6																
7																
8																
9																
10																
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17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

shallow stream with grassy vegetation
shallow pools, silt bottom, not great habitat
no fish observed

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Boston OF	Survey Date (d/m/y):	04-Sep-10	Coordinates:	Coordinates:
SITE:	S14 (b)	Survey Crew:	JG/CB	444570/7506092	
Survey Distance (m)	25				

Temperature (°C):	7.2	Transparency:	poor
Channel Velocity (m/s):	0	Conductivity (uS/cm):	84.1
Current Flow Conditions:	none	pH:	6.1
Discharge estimate (m^3/s)	0		

Comments

poor fish habitat/not continuous stream

Weather:

rain/clouds/wind 20 km/h

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	P	8.2	4.5	0.1			0.5	1.6	100	0	0	0	0	S	0.10	0.34	D	T
2	P	25	7.5	0.1			1.5	7.4	100	0	0	0	0	S	0.61	0.81	D	T
3																		
4																		
5																		
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19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: cyprinids

Rearing: cyprinids

Adult Feeding: no

Over-wintering: no

Migration: no

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston OF **SITE:** S14 (b) **DATE:** 04/09/2010 **CREW:** JG/CB

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.30	0.30	S	S	100	0	50	30	0	0	0	2	0034 (upstream), 0035 (downstream)	10 to 20	20	15
2	0.25	0.50	S	S	100	0	70	0	0	0	0	2	0036 (up) 0037 (down)	0	0	0
3																
4																
5																
6																
7																
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9																
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14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Aimaokatalok OF	Survey Date (d/m/y):	04-Sep-10	Coordinates:	Coordinates:
SITE:	S14_c	Survey Crew:	J. Gabora/ C. Bolt	444445/7506033	
Survey Distance (m)	25			downstream coordinates	

Temperature (°C):	8.4	Transparency:	clear
Channel Velocity (m/s):		Conductivity (uS/cm):	72
Current Flow Conditions:	slow flow	pH:	7.14
Discharge estimate (m^3/s)			

Comments

viewable throught water column

Weather:

scattered rain/clouds/~20km/h winds

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1		0		1.0														
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: maybe

Rearing: yes

Adult Feeding: yes

Over-wintering: no

Migration: yes-cyprinids

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: _____ **SITE:** S14_c **DATE:** _____ **CREW:** _____

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

Data Entered ☐ **QA/QC** ☐

S14

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Boston	**Survey Date (d/m/y):**	25-Jun-10	**Coordinates:**	**Coordinates:**
SITE:	S15	**Survey Crew:**	MT/CM/CB	444150/7506100	
Survey Distance (m)					

Temperature (^{o}C):		**Transparency:**	clear
Channel Velocity (m/s):		**Conductivity (uS/cm):**	30
Current Flow Conditions:	H	**pH:**	
Discharge estimate (m^3/s)			

Comments

GPS not working

Weather:

overcast

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	G	0	35	0.1	0.40	0.40	8.0	10.0	0	10	65	25	0					
2	G	35	100	0.1	0.40	0.40	13.0	16.0	100	0	0	0	0					
3	P	100	14	0.0	0.80	0.80	9.0	10.0	0	20	55	25	0	S	1.10	0.4		
4	R	114	2	0.1	0.20	0.30	1.6	1.6	100	0	0	0	0					
5	P	116	3	0.0	0.90	1.00	1.6	1.6	0	40	40	20	0	S	1.00	0.2		
6	R	117	2.5	0.1	0.20	0.70	1.2	1.2	70	30	0	0	0					
7	P	121.5	3	0.0	0.90	1.40	1.9	1.9	10	70	10	10	0	S	1	0.2		
8	G	124.5	2	0.2	0.80	0.40	0.8	0.8	60	0	25	15	0					
9	G	126.5	20	0.2	0.5	0.8	1.4	5	40	10	20	30	0					
10	P	146.5	6	0	1.1	1.3	2.5	4.5	100	0	0	0	0	S	1.5	0.5		
11	R	152.5	5	0.1	0.4	0.6	1.5	1.5	100	0	0	0	0					
12	P	157.5	5	0	0.8	0.9	2.2	3.7	100	0	0	0	0	S	0.9	0.3		
13	G	162.5	5	0.1	0.2	0.3	2	4	100	0	0	0	0					
14	P	167.5	10	0	1.3	1.5	6	6.5	90	5	5	0	0	S	1.3	0.2		
15	R	177.5	5	0.2	0.2	0.4	2	2.5	100	0	0	0	0					
16	P	182.5	11	0	0.8	1	3	4	90	10	0	0	0	S	0.95	0.2		
17	G	193.5	40	0.1	0.3	0.5	13.5	15	100	0	0	0	0					
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating: IMPORTANT

Spawning: good

Rearing: good

Adult Feeding: poor

Over-wintering: poor

Migration: fair

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston **SITE:** S15 **DATE:** 25/06/2010 **CREW:** MT/CM

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.10	0.10	S	S	0	65	0	0	0	0	0	256		0		
2	0.10	0.10	S	S	0	0	85	0	0	0	0	257-8		0		
3	0.10	0.10	S	S	100	25	0	0	50	0	0	259		0		
4	0.50	0.50	S	S	0	0	80	0	0	0	0	263		0		
5	0.50	0.50	S	S	100	0	15	0	90	0	0	264		0		
6	0.50	0.50	S	S	0	0	70	0	0	0	0	265		0		
7	0.50	0.50	S	S	100	10	0	0	0	0	0	266		0		
8	0.50	0.50	S	S	0	15	25	0	50	0	0	267		0		
9	0.30	0.30	S	S	0	30	40	0	25	0	0	268-9		0		
10	0.30	0.30	S	S	100	0	25	0	15	0	0			0		
11	0.20	0.20	S	S	0	0	80	0	0	0	0			0		
12	0.20	0.20	S	S	100	0	25	0	15	0	0			0		
13	0.20	0.20	S	S	0	0	85	0	0	0	0			0		
14	0.20	0.20	S	S	100	0	20	0	0	0	0			0		
15	0.40	0.40	S	S	0	0	95	0	0	0	0			0		
16	0.2	0.2	S	S	100	0	20	0	0	0	0					
17	0.1	0.1	S	S	0	0	90	0	0	0	0					
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments: *lots of cobble, gravel, boulder on bottom, several deep pools*
good grayling spawning habitat
good for juv. Lake trout also

Data Entered ☐ **QA/QC** ☐

S15

S15

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Boston camp	Survey Date (d/m/y):	25-Jun-10	Coordinates:	Coordinates:
SITE:	S16	Survey Crew:	C. Martin	upstream 443703/7505541	downstream 443566/7505458
Survey Distance (m)	200				

Temperature (°C):	10	Transparency:	high	Comments
Channel Velocity (m/s):		Conductivity (uS/cm):	48	
Current Flow Conditions:	med	pH:		Weather:
Discharge estimate (m^3/s)				overcast

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	max	Mean	max	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	P	0	9	0.0				3.0	100	0	0	0	0	S	1.75	0.1	N	
2	R	9	6	0.5	0.30	0.35	0.7	1.1	100	0	0	0	0				N	
3	P	15	8	0.0			2.0	3.0	90	0	10	0	0	S	1.15	0.25	N	
4	R	23	109	2.0	0.20	0.30	0.2	14	60	0	30	10	0				N	
5	P	132	9	0.0	0.35		1	1	0	0	40	60	0	S	0.45	0.1	N	
6	R	141	14	1.5	0.30	0.40	0.3	0.85	10	10	70	10	0				N	
7	P	155	7	0.0	0.65		3.5	8	90	0	0	10	0	S	0.7	0.2	N	
8	R	162	38	2.5			0.3	4.5	100	0	0	0	0					
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: P

Rearing: G

Adult Feeding:

Over-wintering: P

Migration:

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston Camp **SITE:** S16 **DATE:** 25/06/2010 **CREW:** C. Martin

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	U	U	20	0	30	0	0	0	0	105-0171	view of sample reach from US			
2	0.00	0.00	U	U	0	0	90	0	0	0	0	172	view US of reach			
3	0.00	0.00	U	U	50	0	40	0	0	0	0	173	view of long riffle			
4	0.00	0.00	U	U	0	15	60	0	0	0	0	174	view US of reach middle			
5	0.00	0.00	U	U	5	15	60	0	0	0	0	175	view ds of reach middle			
6	0.00	0.00	U	U	0	10	30	0	0	0	0	176	view of reach from DS			
7	0.00	0.00	U	U	60	0	20	0	0	0	0	177	view of stream below reach			
8	0.00	0.00	U	U	40	0	25	0	0	0	0					
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

GPS point 4009

Comments:

upper end of sample reach is confluence of two small streams
pool 1- one juvenile (~20cm TL) observed
pool 3 has small fish in
stream became more restricted as progressed downstream
braided riffles at time

OVERALL: critical
deep pools with isntream veg and flowing water
juvenile fish observed
moderately complex

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Potential road crossing SE of Aimaokatalok | **Survey Date (d/m/y):** 22-Sep-10 | **Coordinates:** | **Coordinates:**

SITE: S16 | **Survey Crew:** JG/SL | 44370/7505541

Survey Distance (m) 200 | center of reach

Temperature (°C): 3.1 | **Transparency:** very clear

Channel Velocity (m/s): ~1m/s | **Conductivity (uS/cm):** 121.5

Current Flow Conditions: fast | **pH:** 7.99

Discharge estimate (m^3/s) unknown

Comments

excellent fish habitat, glide/pool sequence, clearn firm substrate

Weather:

no wind/scattered clouds/ +1 degrees C

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	R	0	29	2.0	0.20	0.40	1.0	2.0	0	0	95	5	0				N	T
2	G	29	15	2.0	0.20	0.40	3.0	11.0	80	20	0	0	0				N	T
3	P	46	9	1.0			5.0	6.0	100	0	0	0	0	S	1.50	0.75	N	T
4	R	55	3	3.0	0.20	0.40	1	2	100	0	0	0	0				N	T
5	G	58	4	2.0	0.20	0.40	1.5	2.5	100	0	0	0	0				N	T
6	P	62	5	1.0			5	5.5	100	0	0	0	0	S	2.50	1.25	N	T
7	R	67	30	5.0	0.15	0.20	1.5	3	100	0	0	0	0				N	T
8	P	97	8	1.0					100	0	0	0	0	S	2	1	N	T
9	R	105	22	3	0.15	0.25	2.5	6.5	100	0	0	0	0				N	T
10	G	127	10	1	0.2	0.25	0.5	11	100	0	0	0	0				N	T
11	R	37	62	4	0.15	0.25	2	4	100	0	0	0	0				N	T
12		199																
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: good

Rearing: good

Adult Feeding: good

Over-wintering: poor

Migration: good in spring to midsummer

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Potential stream crossing **SITE:** S16 **DATE:** 22/09/2010 **CREW:** JG/SL

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.20	0.15	H	H	0	2	0	0	2	0	0	247		0	100	100
2	0.20	0.15	H	H	0	0	90	0	0	0	0	248		0	100	S
3	0.10	0.30	H	H	100	0	10	0	0	0	0	249		0	100	100
4	0.10	0.15	H	H	0	0	90	0	0	0	0	250		0	100	100
5	0.10	0.15	H	H	0	0	75	0	0	0	0	250		0	100	100
6	0.10	0.20	H	H	100	0	7	0	2	0	0	250		0	100	100
7	0.20	0.15	H	H	0	0	95	0	0	0	0	251		0	100	100
8	0.10	0.10	H	H	100	0	20	0	0	0	0	252		0	100	100
9	0.10	0.10	H	H	0	0	60	0	0	0	0	253		0	100	100
10	0.10	0.10	H	H	0	0	60	0	0	0	0	254		0	100	100
11	0.10	0.20	H	H	0	0	30	0	0	0	0	255		0	100	100
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

Data Entered ☐ **QA/QC** ☐

S16

S16

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Stickleback OF
SITE: S17
Survey Distance (m): 100

Survey Date (d/m/y): 10-Aug-10
Survey Crew: MT/IK

Coordinates: 441655/7504997

Coordinates:

Temperature (°C): 19.2
Channel Velocity (m/s): near zero
Current Flow Conditions: low
Discharge estimate (m^3/s): near zero

Transparency: turbid
Conductivity (uS/cm): 93.2
pH: 8.08

Comments
streambed muddy, dry, turbid, very warm water

Weather:
sunny, windy, hot

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	P	0	40	0.0	0.70	1.00	3.0	58.0	90	0	0	10	0	S	0.80	0.4	N	
2	R	50	36	1.0	0.20	0.50	7.0	51.0	20	20	20	40	0				N	
3	G	76	24	4.0	0.30	0.60	19.5	51.0	90	0	0	10	0				N	
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
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17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall
BF = Boulder Field, passage through the boulder arrangement is not possible for fish
D = dry channel, no stream flow
NC = no distinct channel, water drains over land
N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season
P = Permanent, all year round

Overall Rating:

Spawning: fair

Rearing: fair-good

Adult Feeding: poor

Over-wintering: poor

Migration: fair-good

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Stickleback Lake OF **SITE:** S17 **DATE:** 08/10/2010 **CREW:** MT/IK

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.30	0.30	S	S	100	5	20	0	10	0	0		upper banks at freshet 100% willows	0	100	100
2	0.30	0.30	S	S	0	45	5	0	0	0	0			0	100	100
3	0.30	0.30	S	S	0	5	5	0	0	0	0			0	100	100
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

very muddy, low level, almost no flow visible except at riffle
many small sticklebacks
saw one larger possible salmonid (100+mm)

Data Entered ☐ **QA/QC** ☐

S17 (foreground – aerial view)

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Stickleback Lake OF | Survey Date (d/m/y): 26-Jun-10 | Coordinates: 441932/7504231 | Coordinates: 441910/7504149

SITE: S18 | Survey Crew: MS/CK

Survey Distance (m) 160

Temperature (°C): 5 | Transparency: C

Channel Velocity (m/s): | Conductivity (uS/cm): 30.1

Current Flow Conditions: | pH:

Discharge estimate (m^3/s):

Comments

Weather:

high cloud sunny periods cool breeze

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m) Mean	Depth (m) max	Width (m) Mean	Width (m) max	Bed Material Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Pool Info Type	Pool Info Depth (m) Max	Pool Info Depth (m) Crest	Fish Passage Barriers Type	Fish Passage Barriers T/P
1	G	0	13	1.0	0.30	0.40	3.0	3.5	90	10	0	0	0					
2	R	13	10	1.0	0.30	0.40	3.0	3.5	90	10	0	0	0					
3	P	23	5	1.0	0.50	0.50	3.0	3.0	90	10	0	0	0	S	0.50	0.3		
4	R	28	8	1.0	0.30	0.30	1	1.5	90	10	0	0	0					
5	P	36	10	1.0	0.80	1.00	1	1.5	10	90	0	0	0	S	1.00	0.3		
6	R	46	10	1.0	0.50	0.70	0.8	1	90	10	0	0	0					
7	P	56	3	1.0	0.80	1.00	1.3	1.8	80	20	0	0	0	S	1	0.5		
8	R	59	22	1.0	0.40	0.40	2	3	80	20	0	0	0					
9	P	81	10	1.0	0.8	1	1.5	1.5	80	20	0	0	0	S	1	0.4		
10	G	91	40	1.0	0.4	0.6	1.5	1.5	90	10	0	0	0					
11	R	130	30	1.0	0.4	0.4	1.5	1.5	80	20	0	0	0					
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: good

Rearing: good

Adult Feeding: good

Over-wintering: good- access to lakes

Migration: G

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: _____ **SITE:** S18 **DATE:** 26-Jun-10 **CREW:** MS/CK

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	H	H	0	0	90	5	5	0	0	290				
2	0.00	0.00	H	H	0	0	90	5	5	0	0					
3					50	0	40	10	0	0	0					
4					0	0	90	5	5	0	0					
5					70	0	15	0	15	0	0					
6					0	0	50	0	50	0	0	291	D pic shows multiple habitat			
7					50	0	10	0	40	0	0	292	D short deep pool			
8					0	0	50	0	50	0	0					
9					50	0	25	0	25	0	0					
10					0	0	50	0	50	0	0	293	D			
11					0	0	80	20	0	0	0	295	D			
12												294	weir at top of stream			
13												297/8	debris in channel			
14												296	upstream mid-site			
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

deep mid-channel with shallow margins throughout.
habitat complexity will increase at lower flows
undercut banks mid channel provide a lot of cover

OVERALL= IMPORTANT
good fish habitat for multiple species and all LH stages
spawning gravel quite abundant

Data Entered ☐ **QA/QC** ☐

S18

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Trout Lake Outflow
SITE: S19
Survey Distance (m): 350

Survey Date (d/m/y): 26-Jun-10
Survey Crew:

Coordinates: upstream 442447/7503727
Coordinates: downstream 742369/7504008

Temperature (°C): 7 (est)
Channel Velocity (m/s): 0.5
Current Flow Conditions: H
Discharge estimate (m^3/s)

Transparency: C
Conductivity (uS/cm): 28.2
pH:

Comments
start site at lake outlet

Weather:
high overcast cool breeze

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m) Mean	Depth (m) max	Width (m) Mean	Width (m) max	Bed Material Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Pool Info Type	Pool Info Depth (m) Max	Pool Info Depth (m) Crest	Fish Passage Barriers Type	Fish Passage Barriers T/P
1	G	0	50	0.5	0.80	1.40	9.0	15.0	100	0	0	0	0					
2	R	50	55	0.5	0.20	0.50	15.0	22.0	100	0	0	0	0					
3	G	110	22	0.5	0.30	0.30	17.0	22.0	100	0	0	0	0					
4	R	132	100	1.0	0.30	0.50	1	3	10	10	30	60	0					
5	P	233	10	1.0	0.40	0.50	8	12	10	40	40	10	0	S	0.50	0.3		
6	R	243	20	1.0	0.30	0.50	7	10	5	40	40	10	0					
7	P	263	30	1.0	1.00	1.30	12	15	30	30	30	10	0	S	1.5	0.3		
8	G	293	28	1.0	0.20	0.40	15	18	80	10	10	0	0					
9	R	321	30	1.5	0.2	0.3	2	3	25	30	40	5	0					
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall
BF = Boulder Field, passage through the boulder arrangement is not possible for fish
D = dry channel, no stream flow
NC = no distinct channel, water drains over land
N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season
P = Permanent, all year round

Overall Rating:

Spawning: good

Rearing: good

Adult Feeding: good

Over-wintering: good

Migration: good

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Trout Lake Outflow **SITE:** S19 **DATE:** 26-Jun-10 **CREW:**

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	H	H	0	0	100	0	0	0	0	256				
2	0.00	0.00	H	H	0	0	50	0	50	0	0	257	D			
3	0.00	0.00	H	H	0	0	100	0	0	0	0	258	D			
4	0.10	0.30	H	H	0	70	5	5	20	0	0	259, 261	259-D, 261U	5	2.5	2.5
5	0.00	0.00	H	H	30	15	30	5	20	0	0	262-264	262-D, 263/264-substrate	1	0.5	0.5
6	0.00	0.00	H	H	0	15	40	5	40	0	0	265	D	0.5	0.25	0.25
7	0.00	0.00	H	H	50	5	40	5	0	0	0	266	D	0.5	0	0.5
8	0.00	0.00	H	H	0	0	90	5	5	0	0	267	U	0.5		0.5
9	0.00	0.00	H	H	0	15	40	5	40	0	0	268	D	0.5	0.25	0.25
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

unit 9 (R) flows into pond then more long riffle (116m)
flood signs indicate drop in flow ~1.0m with debris caught high in riparian D of pond

unit 1 flowing at bankfull depth
unit 2 with 50% undercut bank, midstream channelization in riffle provide cover

observed stickleback and salmonid fry swimming in riffles and among upstream veg
large fish (LKTR? Char?) observed in stream

Canopy cover provided by shrubs

OVERALL FISH HABITAT= important
spawning rearing migration and overwintering for many species

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Trout Lake Outflow	Survey Date (d/m/y): 16-Aug-10	Coordinates:	Coordinates:	
SITE: S20	Survey Crew: GM, LK	442368/7503979	442414/7503890	
Survey Distance (m) 100		start	end	
Temperature (°C): 13	Transparency:	Comments		
Channel Velocity (m/s): NA	Conductivity (uS/cm): 81	beautiful tundra stream, excellent fish habitat for juveniles		
Current Flow Conditions: L	pH: 7.7	Weather:		
Discharge estimate (m^3/s) NA		sunny, slightly windy		

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	P	0	16	0.0	0.27/0.5		5.1/8.5	11.5	0	0	0	0	0	S	0.93	start 0.62 end 0.50	N	
2	G	16	9.5	0.0	0.42/0.3		1.9/2.5	8.0	5	65	30	0	0				N	
3	P	25.5	6.3	0.0	0.46/0.52		4.5/4.0	8.3	50	30	15	5	0	U	0.70	start 0.46	N	
4	G	31.8	9.6	0.0	0.39/0.25		3.8/3.5	5	90	5	4	1	0				N	
5	c	41.4	10.4	0.5	0.16/0.21		3.3	5	10	18	70	2	0				N	
6	c	51.8	37	1.0	0.24/0.28		1.8	3.6	5	5	85	5	0				N	
7	G	88.8	7	0.0	0.30/0.32		2.4	3	5	55	40	0	0				N	
8	c	95.8	4.2	0.5	0.30/0.29		2.4	3.2	0	5	85	10	0				N	
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: _____

Rearing: _____

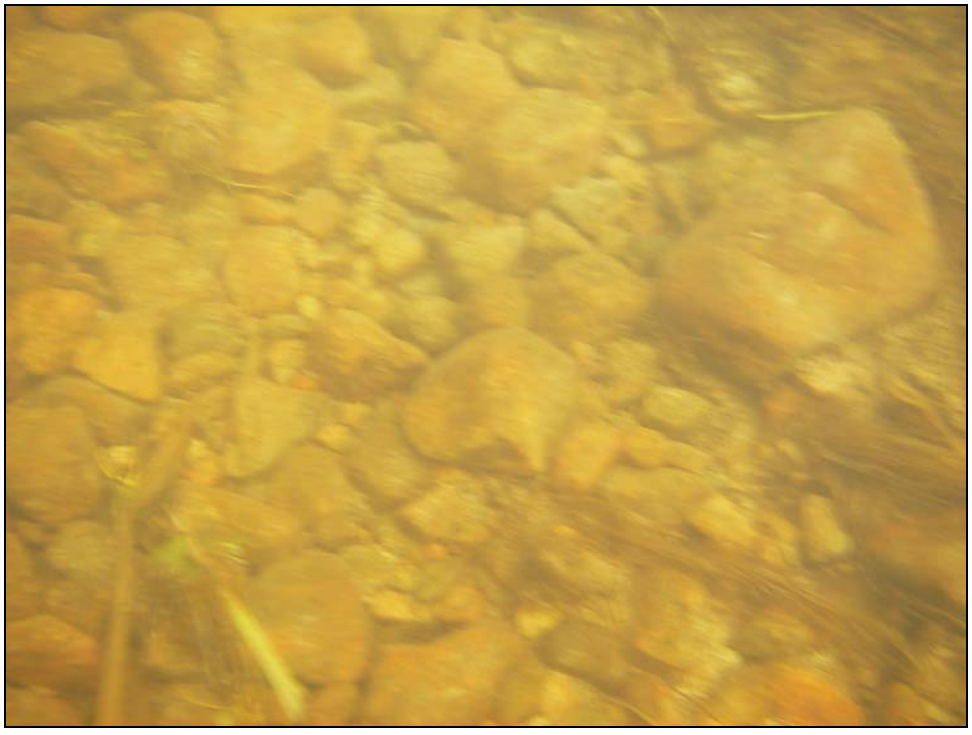
Adult Feeding: _____

Over-wintering: _____

Migration: _____

Data Entered ☐ **QA/QC** ☐

S19



S19

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Trout Lake Outflow **SITE:** S20 **DATE:** 16/08/2010 **CREW:** GM/LK

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1			S	S	20	0	50	5	0	0	0	2349-2350	instream vegetation taken upstream	0	0	0
2	0.02	0.10	U	U	0	0	5	1	2	0	0	2351-2355		0	0	0
3			U	U	0	0	5	5	0	0	0	2356-7		0	0	0
4			U	U	0	2	2	1	2	0	0	2358		0	0	0
5	0.05	0.05	S	S	0	1	1	2	1	0	0	2359-60		0	0	0
6			S	S	0	2	10	10	5	0	0	2361-62	salmonids observed (juveniles)	0	0	0
7			U	U	0	0	2	5	10	0	0	2365		0	0	0
8			S	S	0	5	2	10	10	0	0	2363		0	0	0
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

beautiful tundra stream.
Lots of instream vegetation and riparian ??? Along stream edge
observed many juvenile salmonids during survey (juvenile Arctic grayling)

Data Entered ☐ **QA/QC** ☐

S20

S20

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston Tailing #1 | Survey Date (d/m/y): 24-Jun-10 | Coordinates: | Coordinates:
SITE: S21 | Survey Crew: MS | upstream 445530/7503770 | downstream 445402/7504033
Survey Distance (m) 300

Temperature (°C): 17 | Transparency: C
Channel Velocity (m/s): | Conductivity (uS/cm): 27.6
Current Flow Conditions: H | pH:
Discharge estimate (m^3/s)

Comments
seepage between two ponds

Weather:
sunny clear warm

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
															Depth (m)			
					Mean	max	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Max	Crest	Type	T/P
1	R	0	300	1.0	0.20	0.30	0.3	0.5	100	0	0	0	0					
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall
BF = Boulder Field, passage through the boulder arrangement is not possible for fish
D = dry channel, no stream flow
NC = no distinct channel, water drains over land
N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season
P = Permanent, all year round

Overall Rating:

Spawning: _____
Rearing: _____
Adult Feeding: _____
Over-wintering: _____
Migration: _____

Data Entered ☐ QA/QC ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston tailing #1 **SITE:** S21 **DATE:** 24-Jun-10 **CREW:** MS/MT

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	H	H	0	50	50	0	0	0	0		seepage through boulders			
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

OVERALL HABITAT: Marginal

Seepage channel between ponds, periodic high flow narrow channels (0.7-0.5m wide) flowing between braids. Some subsurface flow areas. Stickleback in upstream pond and downstream pond. Few in seepage channels

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Tail Stream 2	Survey Date (d/m/y):	17-Aug-10	Coordinates:	Coordinates:
SITE:	S22	Survey Crew:	GM/BG	445550/7503515	
Survey Distance (m)	100			upstream (end)	
Temperature (°C):	8.9	Transparency:		Comments	
Channel Velocity (m/s):		Conductivity (uS/cm):	81.9		
Current Flow Conditions:	low	pH:	7.55	Weather:	
Discharge estimate (m^3/s)				cloudy, slight wind, with a few sunny patches	

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	P	0	15	0.0	0.15		12.0		98	2	0	0	0					
2	G	15	17	0.0	0.11/0.1, 0.10/0.17		0.64/0.89		99	0	1	0	0					
3	R	32	22	0.0	0.05/0.06		0.98/0.98		100	0	0	0	0					
4	G	54	46		0.05/0.08		0.43/0.91		100	0	0	0	0					
5																	NC/BF	
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: N

Rearing: N

Adult Feeding: N

Over-wintering: N

Migration: N

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: _____ **SITE:** S22 **DATE:** _____ **CREW:** GM/BG

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1					0	0	2	30	0	0	0	2383	braided			
2					0	0	2	20	0	0	0	84-85	forks into two			
3					0	0	2	20	0	0	0	86-87	left branch (facing US), runs from dry			
4					0	0	0	0	0	0	0	88	righ branch			
5					0	0	2	20	10	0	0	89	facing DS, ?? Flow, braiding flows over last 2			
6												90	facing US, pools prior to BF			
7												91	BF US of where stream flows from			
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

Note: 25 m electrofishing section was done with initial glide/riffle sequence

stream input is highly braided, composed of mini-vegetated islands
Moving upstream, channel narrows into a single braid (but later splits into 2, with one branch disappearing into the land, and other dissappears below surface in a boulder field photo 91)
mostly overland flow, emerging from upstream boulder field

photo 2381: facing southeast at pond input (and start of TailStrm2)
Photo 2382
Photo 2383: facing north (and upstream where stream meets pond)

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Tailstrm	Survey Date (d/m/y):	17-Aug-10	Coordinates:	Coordinates:
SITE:	S23	Survey Crew:	GM/BG	444818/7503270	
Survey Distance (m)					
Temperature (°C):	8.1	Transparency:		Comments	
Channel Velocity (m/s):		Conductivity (uS/cm):	137.8		
Current Flow Conditions:	low	pH:	8.36	Weather:	
Discharge estimate (m^3/s)				overcast, windy	

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	P	0	29						90	3	5	2	0	U	0.20		NC	T
2	no channel	29	46														NC	
3	BF	46	100														BF	
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: _____

Rearing: _____

Adult Feeding: _____

Over-wintering: _____

Migration: _____

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: _____ **SITE:** S23 **DATE:** _____ **CREW:** _____

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1												2376-77	stagnant pool @ downstream			
2												2378	dry channel			
3												2379-80	boulder field			
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

1st habitat unit- pool, 2nd habitat unit- no distinct channel, grassy field, 3rd habitat unit boulder field

photo 2376-2377 facing north ("downstream" out ??? Of pond)
pool north of pond, then grassy area, follow by BF
** no fish passage **

Habitat unit: beginning @ upstream end (output)
3 minnow traps were set at "upstream" pond (444821/7503265) on August 17, 2010
location and times in and out:
1) 444870/7503244 10:44/3:13
2) 444885/7503236 10:45/3:15
3) 444896/7503254 10:50/3:15

see diagram

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston Tailings (Map 6) Pond #1
SITE: S24
Survey Distance (m)

Survey Date (d/m/y): 24-Jun-10
Survey Crew: MS/MT

Coordinates: upstream 448331/7503236
Coordinates: downstream 448516/7503256

Temperature (°C): 12
Channel Velocity (m/s):
Current Flow Conditions:
Discharge estimate (m^3/s) 0.1

Transparency: C
Conductivity (uS/cm): 27.7
pH: not working

Comments
northeast corner tailings

Weather:
clear, sunny, warm, light breeze

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
															Depth (m)			
					Mean	max	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Max	Crest	Type	T/P
1	G	0	200	0.5	6.10	0.70	11.0	18.2	100	0	0	0	0	None			N	
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall
BF = Boulder Field, passage through the boulder arrangement is not possible for fish
D = dry channel, no stream flow
NC = no distinct channel, water drains over land
N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season
P = Permanent, all year round

Overall Rating:

Spawning: good
Rearing: good
Adult Feeding: good
Over-wintering: good
Migration: good

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston SE tailings **SITE:** S24 **DATE:** 24-Jun-10 **CREW:** MS/CK/MT/C

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	H	H	0	0	90	0	0	0	0	190	D @ lake inlet	0	0	0
2												192	U @ top of site			
3												193	D @ top of site			
4												194/5	midstream channel and substrate			
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

widths	*depths*	*(at corner of datasheet, not sure if more info)*
16.8	*0.2*	
18.2	*0.3*	
9.2	*0.5*	
2	*0.4*	
7.6	*0.4*	
	0.7	

Comments:

max widths furthest downstream near lake

banks slope to mid channel trench during freshet

OVERALL HABITAT: important- limited gravel for salmonid spawning but good migration and rearing

Sinuous laminar flow connecting series of ponds.
Periodic defined channel in middle stream provides most of the cover.
Stickleback observed throughout channel
riparian veg=grass
No gravel found but abundant cover for stickleback spawning and rearing
abundant flow provides migration corridors
channel banks

Data Entered ☐ **QA/QC** ☐

S24

S24

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: TailStrm3	Survey Date (d/m/y): 17-Aug-10	Coordinates:	Coordinates:
SITE: S25	Survey Crew: GM/BG	448320/7503213	448294/7503124
Survey Distance (m) 100		start (DS)	end (US)

Temperature (°C): 9.2	Transparency:	Comments
Channel Velocity (m/s):	Conductivity (uS/cm): 76.3	typical low slope tundra stream
Current Flow Conditions: low	pH: 7.5	Weather:
Discharge estimate (m^3/s)		cloudy, slight wind

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	G	0	20	0.0	0.15/0.20		4.4/2.2		100	0	0	0	0					
2	R	20	14	0.0	0.10/0.15		1.7/1.4		100	0	0	0	0					
3	G	34	13	0.0	0.10/0.20		3.5/2.5		100	0	0	0	0	U	0.93	US 0.25, DS 0.30		
4	R	47	7	0.0	0.07/0.35		0.8/1.0		100	0	0	0	0					
5	P	54	10	0.0	1.50		4		100	0	0	0	0	U	~2.0	US 1.25, DS 0.28		
6	R	64	9	0.0	0.35		1.5/1.1		100	0	0	0	0					
7	P	73	9	0.0	0.54/0.75		3.3/4.7		100	0	0	0	0	U	~1.0	US 0.21, DS 0.26		
8	R	82	10	0.0	0.16/0.10		1.6/1.2		100	0	0	0	0					
9	P	92	8	0	0.65/0.35		2.1/1.6		100	0	0	0	0	U	0.67	US, DS 0.19		
10		100																
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: X

Rearing: yes

Adult Feeding: X

Over-wintering: yes

Migration: X

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: _____ **SITE:** S25 **DATE:** _____ **CREW:** _____

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1					0	0	5	1	0	0	0	2398-2401	facing upstream			
2					0	0	20	5	0	0	0	2402-03	facing upstream			
3					15	0	20	5	2	0	0	2404-05	facing upstream 04-slide, 05-pool			
4					0	0	20	5	5	0	0	2406-2407	facing US 06-riffle, 07-riffle to pool			
5					40	0	10	1	20	0	0	2408-10	facing US, large pool to riffle			
6					0	0	10	5	50	0	0	2411	facing US			
7					30	0	20	2	5	0	0	2412-13	facing US pool			
8					0	0	20	2	10	0	0	2414-15	facing US			
9					50	0	25	2	10	0	0	2416-17	facing US, pool 1 and pool 2			
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

beautiful tundra stream composed mostly of fines, pool-riffle sequence
deep pools have submerged vegetation

Data Entered ☐ **QA/QC** ☐

S25

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston Tailing PD #1
SITE: S26
Survey Distance (m): 200

Survey Date (d/m/y): 24-Jun-10
Survey Crew: MS/CK/MR/C

Coordinates: DS 448302/7503185

Coordinates: upstream 448231/7502992

Temperature (°C): 13
Channel Velocity (m/s): 1
Current Flow Conditions: H
Discharge estimate (m^3/s)

Transparency: C
Conductivity (uS/cm): 27.5
pH:

Comments: site further upstream from site 1003

Weather: clear, sunny, light breeze

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
									Fines	Gravel	Cobble	Boulder	Bedrock		Depth (m)			
					Mean	max	Mean	max	(%)	(%)	(%)	(%)	(%)	Type	Max	Crest	Type	T/P
1	P	0	8	0.5			5.0	6.0	100	0	0	0	0		0.96	0.2	N	
2	R	8	10	0.5	0.30	0.40	0.5	0.5	100	0	0	0	0					
3	P	18	8		0.70	1.30	7.6	5.0	100	0	0	0	0		1.30	0.3		
4	R	26	6		0.50	0.60	0.6	0.6	100	0	0	0	0					
5	P	30	10		0.40	0.80		4	100	0	0	0	0		0.80	0.4		
6	R	40	7		0.30	0.50		0.5	100	0	0	0	0					
7	P	47	5		0.60	0.90		6	100	0	0	0	0		0.9	0.3		
8	R	52	10		0.30	0.80		0.7	100	0	0	0	0					
9	P	62	11.4		0.8	1.2		11.2	100	0	0	0	0		0.9	0.3		
10	R	73	10		0.3	0.4	0.5	0.7	100	0	0	0	0					
11	P	83	10		0.9	0.9		11.2	100	0	0	0	0		0.9	0.4		
12	R	93	10		0.2	0.7		0.5	100	0	0	0	0					
13	P	103	13.3		0.7	0.7		6.9	100	0	0	0	0		0.7	0.2		
14	R	116	60		0.3	0.5	1	1.5	100	0	0	0	0					
15	P	176	16.5		1	1.2		19	95	5	0	0	0		1.2	0.3		
16	R	190	10		0.2	0.2	2.5	3	100	0	0	0	0					
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall
BF = Boulder Field, passage through the boulder arrangement is not possible for fish
D = dry channel, no stream flow
NC = no distinct channel, water drains over land
N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season
P = Permanent, all year round

Overall Rating:

Spawning: good-stickles

Rearing: good

Adult Feeding: good

Over-wintering: good

Migration: good

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Trout Lake Outflow **SITE:** S26 **DATE:** **CREW:**

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	H	H	60	0	20	5	15	0	0	197	DS @ midsite			
2					0	0	80	0	20	0	0	198	US at midsite			
3					60	0	20	5	15	0	0	199	DS @ top of site			
4					0	0	80	0	0	0	0	200	U @ top of site			
5					60	0	20	5	15	0	0					
6					0	0	80	0	0	0	0					
7					60	0	20	5	15	0	0					
8					0	0	80	0	0	0	0					
9					60	0	20	5	15	0	0					
10					0	0	80	0	0	0	0					
11					60	0	20	5	15	0	0					
12					0	0	80	0	0	0	0					
13					60	0	20	5	15	0	0					
14					0	0	80	0	0	0	0					
15					60	0	20	5	15	0	0					
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments: *OVERALL Habitat: important*

Sinuous riffle/pool habitat with deep pools separated by short shallow riffles.
Good access to ponds both upstream and downstream during freshet.
Limited ground for spawning of some fish (eg salmonids) but abundant spawning habitat for nest building sticklebacks

Data Entered ☐ **QA/QC** ☐

S26

S26

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston Rd. | Survey Date (d/m/y): 25-Jun-10 | Coordinates: | Coordinates:

SITE: S27 | Survey Crew: | 445080/7508661

Survey Distance (m)

Temperature (°C): 10 (touch estimate) | Transparency:

Channel Velocity (m/s): | Conductivity (uS/cm): 59.5

Current Flow Conditions: | pH:

Discharge estimate (m^3/s)

Comments: wetland seepage

Weather: high broken cloud, sunny periods, warm breeze

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning:

Rearing:

Adult Feeding:

Over-wintering:

Migration:

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston PND Road **SITE:** S27 **DATE:** 25-Jun-10 **CREW:**

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1												216	downstream			
2												217	upstream			
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

OVERALL HABITAT: marginal

also restricted access through subsurface flow sections (no fish observed)

wetland seepage. Channel <0.5 (~0.2-.3m)

all associated with site

wetland pond # 1 445073/7508460 picture 218 (upstream)

wetland pond #2 445078/7508331 picture 219 (downstream

wetland pond # 3 446032/7508248 picture 224, 225

tailings pond 3 north

445428/7507885 picture 226 (u) and 227 (d)

wet ground

Data Entered ☐ **QA/QC** ☐

S27

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Boston tailing #1	Survey Date (d/m/y):	24-Jun-10	Coordinates:	Coordinates:
SITE:	S28	Survey Crew:		445530/7503720	
Survey Distance (m)					
Temperature (°C):		Transparency:	C	Comments	
Channel Velocity (m/s):		Conductivity (uS/cm):	26.4	Diagrams for Upper and Lower Ponds- see data sheets (63+64)	
Current Flow Conditions:		pH:		Weather:	
Discharge estimate (m^3/s)					

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: _____

Rearing: _____

Adult Feeding: _____

Over-wintering: _____

Migration: _____

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: _____ **SITE:** S28 **DATE:** _____ **CREW:** _____

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Trout Lake Outflow | Survey Date (d/m/y): 26-Jun-10 | Coordinates: | Coordinates:
SITE: S29 | Survey Crew: MS | upstream 442367/7504100 | downstream 442266/7504250
Survey Distance (m) 200

Temperature (°C): 7.6 (est) | Transparency:
Channel Velocity (m/s): 1.5 | Conductivity (uS/cm): 38.3
Current Flow Conditions: H | pH:
Discharge estimate (m^3/s)

Comments: start downstream of pond

Weather: high broken cloud, no sun, cool breeze

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
															Depth (m)			
					Mean	max	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Max	Crest	Type	T/P
1	R	0	120	1.5	0.30	0.50	1.5	3.0	5	10	80	5	0					
2	G	120	80	1.0	1.00	1.5	10	25	40	20	30	10.00	0					
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall
BF = Boulder Field, passage through the boulder arrangement is not possible for fish
D = dry channel, no stream flow
NC = no distinct channel, water drains over land
N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season
P = Permanent, all year round

Overall Rating:

Spawning: fair-some gravel

Rearing: G- lots of cover

Adult Feeding: G

Over-wintering: fair-some

Migration: good

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Boston New Camp **SITE:** S29 **DATE:** 26/06/2010 **CREW:** MS/CK

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	H	H	0	30	30	40	30	0	0	270	D	10	5	5
2	0.00	0.00	H	H	0	30	30	10	30	0	0	272	D			
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

fines located mostly along stream margins
instream veg mostly in flooded margins

habitat complexity probably inceases with lower flows

observed large fish (LKTR? CHAR?) near top of site

OVERALL FISH HABITAT: IMPORTANT
good rearing, some spawning, but migration corridor between lakes and spawning habitat upstream

Data Entered ☐ **QA/QC** ☐

S29

S29

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Inlet to waste rock pond
SITE: S30
Survey Distance (m)

Survey Date (d/m/y): 26-Jun-10
Survey Crew: MS/CK

Coordinates: DS 442612/7502060
Coordinates: upstream 442602/7501876

Temperature (°C): ~ 10 (estimate)
Channel Velocity (m/s): 0.5 (estimate)
Current Flow Conditions: H
Discharge estimate (m^3/s)

Transparency: C
Conductivity (uS/cm): 53.1
pH:

Comments
start ~ 100 m upstream from pond where water starts flowing

Weather:
high broken cloud, light breeze, cool

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
									Fines	Gravel	Cobble	Boulder	Bedrock		Depth (m)			
					Mean	max	Mean	max	(%)	(%)	(%)	(%)	(%)	Type	Max	Crest	Type	T/P
1	R	0	8	0.5	0.20	0.20	5.0	5.0	100	0	0	0	0					
2	G	8	12	0.5	0.20	0.20	10.0	10.0	0	0	0	0	0					
3	R	20	10	0.5	0.30	0.50	2.0	2.0	80	20	0	0	0					
4	P	30	40	0.5	1.00	2.00	18	20	100	0	0	0	0	S	2.00	0.3		
5	R	80	14	0.5	0.20	0.30	3	2.5	100	0	0	0	0					
6	P	84	15	0.5	1.50	2.00	10	12	80	20	0	0	0	S	2.00	0.2		
7	R	100	4	0.5	0.30	0.50	3	3	100	0	0	0	0					
8	P	104	40	0.5	1.50	2.00	20	25	0	0	0	0	0	S	2	0.3		
9	R	144	6	0.5	0.3	0.4	5	5	0	0	0	0	0					
10	P	150	15	0.5	2	3	8	12	0	0	0	0	0	S	3	0.3		
11	R	165	8	1.5	0.4	0.4	1	1	80	20	0	0	0					
12	P	173	20	0.5	1.5	2	12	15	100	0	0	0	0	S	2	0.4		
13	G	193	15	U	0.3	0.3	8	8	100	0	0	0	0					
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall
BF = Boulder Field, passage through the boulder arrangement is not possible for fish
D = dry channel, no stream flow
NC = no distinct channel, water drains over land
N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season
P = Permanent, all year round

Overall Rating:

Spawning: fair- limited gravel

Rearing: G

Adult Feeding: G

Over-wintering: G

Migration: G

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION Inlet to pond near waste rock dump **SITE:** S30 **DATE:** 23/06/2010 **CREW:** MS/CK

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	0.00	H	H	0	0	100	0	0	0	0	274	D	)		
2	0.00	0.00	H	H	0	0	100	0	0	0	0	273	D- filled in pool?	0		
3	0.00	0.00	H	H	0	0	70	0	30	0	0	275	D water quality meter	0		
4	0.00	0.00	H	H	80	0	20	0	0	0	0	276	D			
5	0.00	0.00	H	H	0	0	100	0	0	0	0	277	D			
6	0.00	0.00	H	H	60	0	20	0	20	0	0	278	D			
7	0.00	0.00	H	H	0	0	50	0	50	0	0	279	D			
8					80	0	20	0	0	0	0					
9					0	0	100	0	0	0	0					
10					80	0	20	0	0	0	0	282	D			
11					0	0	100	0	0	0	0					
12					80	0	20	0	0	0	0					
13					0	0	100	0	0	0	0	281	D			
14																
15																
16																
17																
18																
19																
20																

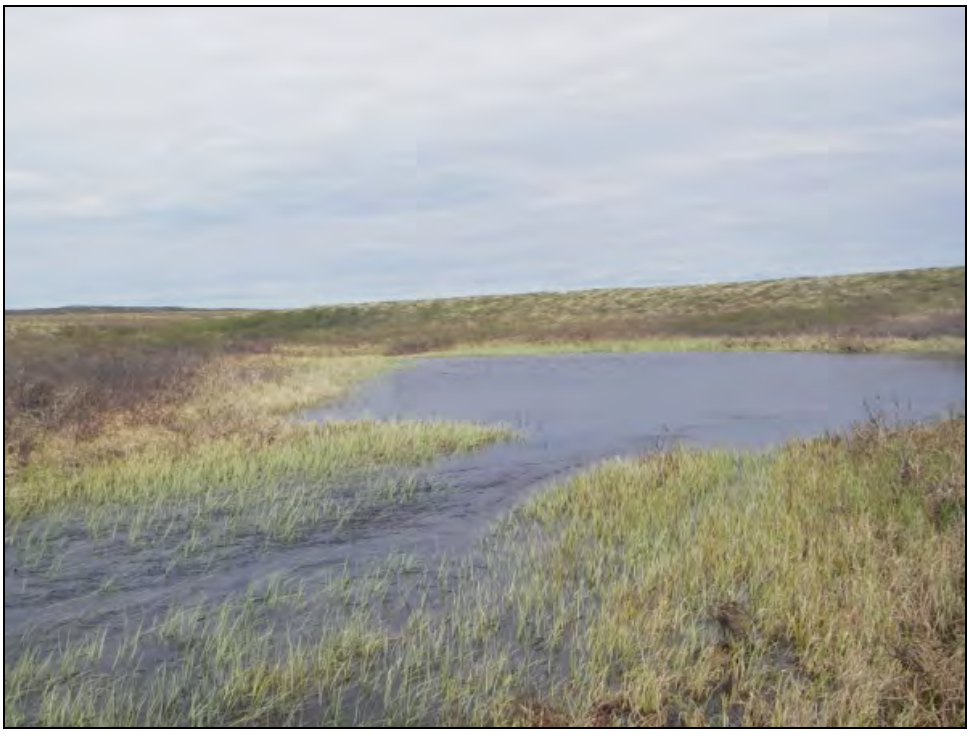
Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments: *swampy inflow into lake, stickleback observed in pools near lake*

OVERALL fish habitat: IMPORTANT
rearing and some spawning for multiple species

Data Entered ☐ **QA/QC** ☐

S30



S30

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Koignuk River	Survey Date (d/m/y):	28-Jun-10	Coordinates:	Coordinates:
SITE:	K River 1	Survey Crew:	CM/EL	upstream 431017/7596355	
Survey Distance (m)	200				

Temperature (°C):	11	Transparency:	med	Comments
Channel Velocity (m/s):		Conductivity (uS/cm):	59.3	
Current Flow Conditions:	high	pH:	7.18	Weather:
Discharge estimate (m^3/s)				sunny with clouds

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	max	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	G	0	200	0.0				69.0	95	5	0	0	0				N	
2																		
3																		
4																		
5																		
6																		
7																		
8																		
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18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: P (sediment mostly fine)

Rearing: F

Adult Feeding: G

Over-wintering: G

Migration: G

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Koignuk River **SITE:** K River1 **DATE:** 28/06/2010 **CREW:** CM/EL

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	0.00	20.00	U	U								104-0210	upstream of reach			
2												211, 212	across reach			
3												213	view of reach from upstream			
4												214	downstream			
5												215	aerial view of reach			
6												216	aerial view of reach			
7												217	aerial view of reach			
8																
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19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

Overall likely critical for overwintering, fish passage through landscape

K. River 1 GPS #2798

very uniform reach
appears deep bank to bank
no visible habitat complexity
wide banks
sand/silt/clay banks
flow uniform, gentle

Data Entered ☐ **QA/QC** ☐

Koignuk River 1

Koignuk River 1

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Koignuk River	Survey Date (d/m/y):	28-Jun-10	Coordinates:	Coordinates:
SITE:	KRiver2	Survey Crew:	CM/EL	429600/7554912	
Survey Distance (m)	200				

Temperature (°C):	9.6	Transparency:	med	Comments: entering ocean
Channel Velocity (m/s):		Conductivity (uS/cm):	50.4	
Current Flow Conditions:	high	pH:	7.42	Weather:
Discharge estimate (m^3/s)		salinity	23.2ppt	sunny w/clouds

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	G	0					88.0											
2	C		32				39.0		0	0	0	0	100					
3	P							125.0						S	deep!	deep!		
4																		
5																		
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Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating: critical

Spawning: poor

extremely fast moving water and no substrate

Rearing: poor

good in estuary

Adult Feeding: poor

Over-wintering: good (deep and near ocean)

Migration: good (just fast moving)

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Koignuk River **SITE:** K River 2 **DATE:** 28/06/2010 **CREW:** CM/EL

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	15.00											221				
2												222				
3												223				
4																
5																
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Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

GPS # 2798

Comments:

Overall rating: Critical

esp. for overwintering and migrations across landscape and into ocean

photos 107-0218, 219, 220- aerial view of cascade/whitewater

fast moving whitewater over narrow bedrock channel (not safe to entre)
enters estuary below (pool)
large san/gravel/cobble bar deposited below

Data Entered ☐ **QA/QC** ☐

Koignuk River 2

Koignuk River 2

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Reference B OF	Survey Date (d/m/y):	28-Jun-10	Coordinates:	Coordinates:
SITE:	Ref B OF	Survey Crew:	EL/CM	upstream 427134/7530417	downstream 427237/7530576
Survey Distance (m)	234			half way (100m) 0427161/7530514	
Temperature (°C):	8.6	Transparency:		Comments	
Channel Velocity (m/s):		Conductivity (uS/cm):	48.1	walking downstream +/- 100m	
Current Flow Conditions:	high	pH:	7.08	Weather:	
Discharge estimate (m^3/s)				sunny, a few clouds	

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
									Fines	Gravel	Cobble	Boulder	Bedrock		Depth (m)			
					Mean	max	Mean	max	(%)	(%)	(%)	(%)	(%)	Type	Max	Crest	Type	T/P
1	R	0	65	3.0	0.50	0.80	33.0	39.0	0	5	60	20	15					
2	P	65	74		0.50	1.30	52.0	74.0	0	20	60	10	0	S	1.30	0.5		
3	G	139	25	1.5	0.50	0.85		58.0	10	15	60	15	0					
4	R	164	70	2.0	0.35	0.55	73	105	10	30	50	10	0					
5																		
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Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: good

lots of gravel/cobble, boulders for interstitial spaces, with riffles

Rearing: good

pools, boulder cover

Adult Feeding: good

Over-wintering: poor-fair

pools not very deep even at high flows

Migration: good/fair

low flows could pose barrier just downstream of sampling site

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Reference B OF **SITE:** Ref B OF **DATE:** June 28 2010 **CREW:** CM/EL

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1					0	20	2	0	0	0	0	198	some small side channels			
2					40	10	0	0	0	0	0	200-201				
3					0	3	0	0	0	0	0	199, 202				
4					0	5	0	0	0	0	0	203-205				
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Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

OVERALL rating: important- critical as long as downstream of sample site doesn't form barrier

at low flows a lot of the stream bed would be dry and channel would be much narrower

photos

upstream of starting point 107-0196
downstream of starting point 107-0196
aerial view of cascades and sample reach 0192
aerial photo of sample reach 0193
view of upper reach 0194
glide below sample reach 206
cascade just below sample reach 207/8
view of sample reach from DS 209

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Reference B Outflow	Survey Date (d/m/y):	26-Aug-10	Coordinates:	Coordinates:
SITE:	Ref B OF	Survey Crew:	EG + Thomas	427069/7530344	427129/7530500
Survey Distance (m)	200			US	DS

Temperature (°C):		Transparency:	clear
Channel Velocity (m/s):		Conductivity (uS/cm):	
Current Flow Conditions:	low	pH:	
Discharge estimate (m^3/s)			

Comments

S1? -fish bearing, >20m

Weather:

cool, overcast

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	R	0	76	~5	0.30	0.58	13.0	28.0	0	20	20	40	20				N	N
2	R	76	100	~5	0.20	0.35	8.0	20.0	0	30	15	40	15					
3																		
4																		
5																		
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20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: good
abundant gravel

Rearing: fair
cover minimal

Adult Feeding: good
juvenile

Over-wintering: good
pools present

Migration: good
still connected at low flow late summer conditions

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Reference B Outflow **SITE:** RB OF DS/RB OF US **DATE:** 26/08/2010 **CREW:** EG/TP

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	NA	NA	NA	NA	2	45	60	0	0	0	0	2647-2659	lower section	0	0	0
2													upper section			
3																
4																
5																
6																
7																
8																
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14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

instream veg= heavy algae, filamentous, large mats

unit 1: riffle- light riffle through boulder garden, slack water at edges where channel widens

boulder/cobble garden, low flow levels, low water levels, short riffle areas with occasional small shallow pools at slack water edges
high abundance of gravel-rich areas, algae (mats and filaments) very abundant
predominantly boulders mixed with coblle and bedrock max depth < 1m even in pools
mean depth approx 0.25m, shallow (0.10m) in riffle
good for migration (no barriers), feeding (smolts and juvs present), overwintering and alge/cobble provides good cover for rearing

Data Entered ☐ **QA/QC** ☐

Reference B Lake Outflow (June)

Reference B Lake Outflow (August)

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Reference D OF	Survey Date (d/m/y):	29-Jun-10	Coordinates:	Coordinates:
SITE:	Ref D OF	Survey Crew:	EL/CM	upstream 448133/7562868	ds 448147/7563077
Survey Distance (m)					

Temperature (°C):	6	Transparency:	moderate	Comments
Channel Velocity (m/s):		Conductivity (uS/cm):	94.1	
Current Flow Conditions:	high	pH:	7.01	Weather:
Discharge estimate (m^3/s)				sunny, clear skies, warm

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
									Fines	Gravel	Cobble	Boulder	Bedrock		Depth (m)			
						max	Mean	max	(%)	(%)	(%)	(%)	(%)	Type	Max	Crest	Type	T/P
1	R	0	25	1.5		1.00	30.0	31.0	30	0	40	30	0					
2	G	25	69	0.5		1.00	30.0	38.0	2	5	25	70	0					
3	R	94	165	1.5		1.00	16.0	26.0	0	0	40	60	0					
4																		
5																		
6																		
7																		
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20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: good

lots of cobbels, good flows

Rearing: fair

some off channels, lots of cover

Adult Feeding: fair

some smaller fish present

Over-wintering: poor-fair

some deep areas but not many

Migration: gppd

conects to ocean, high flows year round

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Reference D outflow **SITE:** Ref D OF **DATE:** June 29 2010 **CREW:** CM/EL

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1					0	15	2	0	0	0	0	240-241				
2					0	40	10	0	0	0	0	242, 244	242 DS and 244 US			
3					0	10	2	0	0	0	0	245, 246	245 DS and 246 US			
4																
5																
6																
7																
8																
9																
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13																
14																
15																
16																
17																
18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

OVERALL: critical: likely major migration route between freshwater and ocean, good flows, good cover

~ 20 cm fish observed in water and another id'd as salmonid

water ~0.4m above rooted ved, lots of instream veg

Photos

108-0240 from upstream point of riffle
241 upstream looking at 1st riffle
247 overall reach from DS
248 view of DS area

Data Entered ☐ **QA/QC** ☐

Reference D Lake Outflow

Reference D Lake Outflow

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Aimaokatalok Lake OF	Survey Date (d/m/y):	29-Jun-10	Coordinates:	Coordinates:
SITE:	Aimaokatalok OF	Survey Crew:	CM/EL	438777/7509090	
Survey Distance (m)	200				

Temperature (°C):		Transparency:	
Channel Velocity (m/s):		Conductivity (uS/cm):	
Current Flow Conditions:		pH:	
Discharge estimate (m^3/s)			

Comments

Outflow of Aimaokatalok Lake into lake to the east

Weather:

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
					Mean	Bank-full	Mean	max	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Depth (m) Max	Depth (m) Crest	Type	T/P
1	G	0	49	0.5	>>1		26.0	30.0	0	0	0	20	80					
2	C	49	51		>>1		16.0	17.0	0	0	0	20	80					
3	P	100	69		>>1		63.0		0	0	20	20	60	S	deep!			
4	R	169	31		>>1		45		0	0	80	20	0					
5																		
6																		
7																		
8																		
9																		
10																		
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18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: poor
water very fast moving, not a lot of small substrate

Rearing: poor
water too fast, easy displacement

Adult Feeding: poor
water displaced, fast moving

Over-wintering: fair
at low flows could be too shallow

Migration: good
between lakes should be sufficient flows year round

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: Aimaokatalok Lake OF **SITE:** Aimaokatalok OF **DATE:** June 29 2010 **CREW:** CM/EL

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1	high	higher	H	H	0	10	0	0	0	0	0	107-0225				
2			H	H	10	20	0	0	0	0	0	226-8				
3	1.50	1.50	H	H	80	20	0	0	0	0	0	229-31				
4			U	U	0	10	0	0	0	0	0	232-3				
5																
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18																
19																
20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

OVERALL RATING: important
especially in terms of connectivity between two lakes
water too fast for fish to persist here over a lot of time

pool could get much higher looking at banks ~1.5 m up from water level is rooted vegetation
Spyder Lake still has a lot of ice cover
Lake to east has no ice visible
Everything assessed here is the entire connection between the two lakes

photo 227 view of cascade from DS
photo 228 view across cascade

see photos for bank heights

Data Entered ☐ **QA/QC** ☐

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION:	Aimaokatalok River	Survey Date (d/m/y):	29-Jun-10	Coordinates:	Coordinates:
SITE:	ARiver	Survey Crew:	CM/EL	upstream 450398/7486717	
Survey Distance (m)	200				

Temperature (°C):	11.4	Transparency:	moderate	Comments
Channel Velocity (m/s):		Conductivity (uS/cm):	25.6	
Current Flow Conditions:	high	pH:	7	Weather:
Discharge estimate (m^3/s)				sunny clear skies

Hab Unit No.	Hab Type	Dist. fr start (m)	Length (m)	Slope (%)	Depth (m)		Width (m)		Bed Material					Pool Info			Fish Passage Barriers	
															Depth (m)			
					min	max	Mean	Bank-full	Fines (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)	Type	Max	Crest	Type	T/P
1	R	0	25		0.10	1.50	41.0		0	20	60	15	0					
2	G	25	175			1.50	73.0	83.0	10	15	15	60	0					
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
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13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Flow Conditions H = High flow, M = Medium flow, L = Low flow

Habitat Unit Under bankfull conditions: 0 - 2.5 m = > 1 m2, 2.5 - 5 m = > 2 m2, 5 - 10 m = > 4 m2, 10 -15 m = > 6 m2, 15 -20 = > 8 m2, > 20 m = > 10 m2

Hab Type P = pool, G = glide, R = riffle, C = cascade, UG = underground, BG = boulder garden

Dist. fr start distance from beginning of the survey to the beginning of the habitat unit being surveyed

Pool Type S = scour, D = dammed, U = unknown

Substrate Sand (< 2 mm), Gravel (2 - 64 mm), Cobble (64 - 256), Boulders (256 - 4000 mm), Bedrock (>4000 mm)

Fish Passage Barriers IF = Impassible waterfall

BF = Boulder Field, passage through the boulder arrangement is not possible for fish

D = dry channel, no stream flow

NC = no distinct channel, water drains over land

N = no barrier to fish passage through the habitat unit

T/P T = temporary, portion of open water season

P = Permanent, all year round

Overall Rating:

Spawning: good

lots of gravels, cobbles, good flow

Rearing: good

lots of cover and small pools

Adult Feeding: good

presence of smaller fish

Over-wintering: good

deep enough

Migration: good

should maintain good flows year round

Data Entered ☐ **QA/QC** ☐

Aimaokatalok River.

Aimaokatalok River.

Hope Bay Belt Project - Fish Habitat Stream Survey Form

LOCATION: A. River **SITE:** Ariver **DATE:** 29-Jun-10 **CREW:** CM/EL

Hab Unit No.	Banks of Channel				Instream Cover							Photos #	Comments	Riparian Cover		
	L Bank Height (m)	R Bank Height (m)	L Bank Stab	R Bank Stab	Pool %	Boulder %	Instream Veg %	Overhang Veg %	Undercut Bank %	LWD %	SWD %			Canopy %	LB %	RB %
1					0	2	0	0	0	0	0	108-0234				
2					0	60	0	0	0	0	0	235				
3																
4																
5																
6																
7																
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20																

Banks of Channel (Stability) H = highly stable, S = stable, U = unstable

Comments:

OVERALL rating: critical

good flows, major water body for passage, ideal habitat for many life stages

Photo

236 looking upstream from riffle
237 looking downstream from riffle
238 looking upstream from DS site

Data Entered ☐ **QA/QC** ☐