Site Description

Study Name	CBWQ-Lardeau
Site	NHLAR01
Sampling Date	Oct 01 2011
Know Your Watershed Basin	Lower Kootenay
Province / Territory	British Columbia
Terrestrial Ecological Classification	Montane Cordillera EcoZone Columbia Mountains and Highlands EcoRegion
Coordinates (decimal degrees)	50.50889 N, 117.27028 W
Altitude	2733
Local Basin Name	Lardeau R
	Lardeau
Stream Order	6

Figure 1. Location Map

Across Reach
Aerial (No image found)

Down Stream
Field Sheet (No image found)
Miscellaneous (No image found)

Substrate

Up Stream

Cabin Assessment Results

Reference Model Summary	
Model	Columbia-Okanagan Preliminary March 2010
Analysis Date	August 29, 2017
Taxonomic Level	Family

Cabin Assessment Results

Predictive Model Variables	Depth-Avg Latitude Longitude Reg-Ice Reg-SlopeLT30%

Reference Groups	**1**	**2**	**3**	**4**	**5**
Number of Reference Sites	9	43	17	12	33
Group Error Rate	22.2%	24.5%	22.2%	25.0%	32.4%
Overall Model Error Rate	26.4%				
Probability of Group Membership	4.3%	1.0%	12.6%	41.6%	40.5%
CABIN Assessment of NHLAR01 on Oct 01, 2011	Divergent				

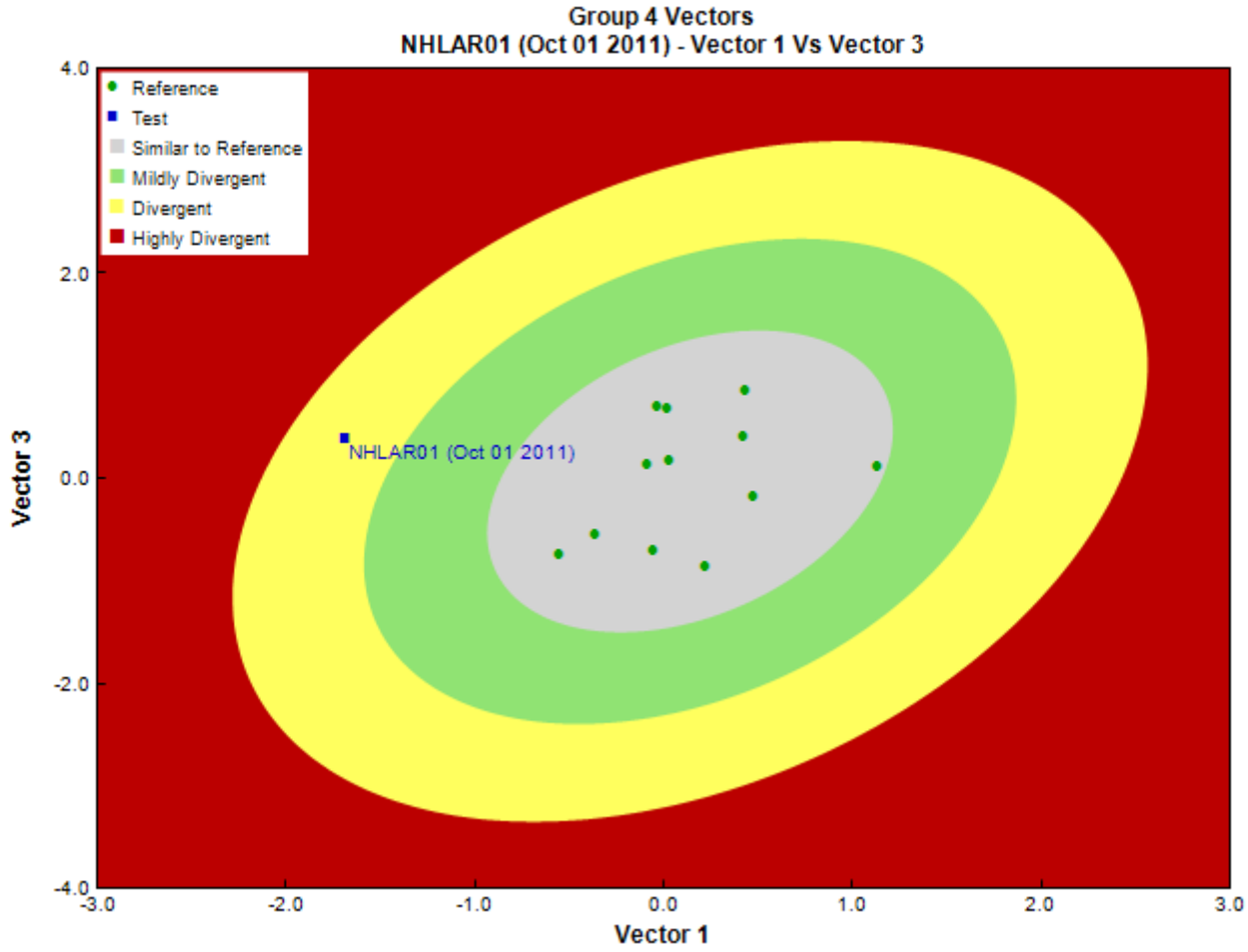

Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

Sample Information

Sampling Device	Kick Net
Mesh Size	400
Sampling Time	3
Taxonomist	Eco Analsyts, EcoAnalysts
Date Taxonomy Completed	January 27, 2012
	Marchant Box
Sub-Sample Proportion	19/100

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
Annelida	Oligochaeta	Tubificida	Naididae	1	5.3
Arthropoda	Arachnida	Trombidiformes	Sperchontidae	1	5.3
	Insecta	Coleoptera	Elmidae	43	226.3
		Diptera	Chironomidae	73	384.2
			Empididae	7	36.8
		Ephemeroptera	Baetidae	1	5.3
			Ephemerellidae	82	431.6
			Heptageniidae	5	26.3
			Leptophlebiidae	4	21.0
		Plecoptera	Chloroperlidae	2	10.5
			Perlodidae	59	310.5
		Trichoptera	Hydropsychidae	19	100.0
			Lepidostomatidae	9	47.4
Cnidaria	Hydrozoa	Anthoathecatae	Hydridae	22	115.8
			Total	328	1,726.3

Metrics

Name	NHLAR01	Predicted Group Reference Mean ±SD
Bray-Curtis Distance	0.91	0.4 ± 0.1
Biotic Indices		
Hilsenhoff Family index (North-West)	3.3	3.2 ± 0.3
Intolerant taxa	--	
Long-lived taxa	1.0	2.1 ± 1.0
Tolerant individuals (%)	--	0.8 ± 0.3
Functional Measures		
% Filterers	5.8	2.2 ± 1.8
% Gatherers	62.5	38.4 ± 12.4
% Predatores	55.8	19.0 ± 8.5
% Scrapers	15.5	63.2 ± 19.7
% Shredder	15.9	27.6 ± 15.2
No. Clinger Taxa	9.0	23.2 ± 6.3
Number Of Individuals		
% Chironomidae	22.3	7.4 ± 6.4
% Coleoptera	13.1	1.5 ± 3.9
% Diptera + Non-insects	31.7	10.8 ± 7.6
% Ephemeroptera	28.0	51.7 ± 18.8
% Ephemeroptera that are Baetidae	1.1	40.6 ± 30.0
% EPT Individuals	55.2	87.7 ± 7.4
% Odonata	0.0	0.0 ± 0.0
% of 2 dominant taxa	47.3	57.9 ± 14.2
% of 5 dominant taxa	85.1	81.6 ± 7.9
% of dominant taxa	25.0	39.8 ± 14.9
% Plecoptera	18.6	31.4 ± 15.4
% Tribe Tanyatarisini	--	
% Trichoptera that are Hydropsychida	67.9	27.0 ± 26.2
% Tricoptera	8.5	4.5 ± 2.8
No. EPT individuals/Chironomids+EPT Individuals	0.7	0.9 ± 0.1
Total Abundance	1726.2	587.4 ± 299.1
Richness		
Chironomidae taxa (genus level only)	1.0	1.0 ± 0.0
Coleoptera taxa	1.0	0.4 ± 0.5
Diptera taxa	2.0	3.3 ± 1.0
Ephemeroptera taxa	4.0	3.8 ± 0.8
EPT Individuals (Sum)	952.6	526.0 ± 285.8
EPT taxa (no)	8.0	13.3 ± 2.7
Odonata taxa	0.0	0.0 ± 0.0
Pielou's Evenness	0.8	0.7 ± 0.1
Plecoptera taxa	2.0	6.3 ± 1.1
Shannon-Wiener Diversity	2.0	1.9 ± 0.4
Simpson's Diversity	0.8	0.8 ± 0.1
Simpson's Evenness	0.4	0.3 ± 0.1

Metrics

Name	NHLAR01	Predicted Group Reference Mean ±SD
Total No. of Taxa	14.0	19.3 ± 3.7
Trichoptera taxa	2.0	3.2 ± 1.4

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NHLAR01
	Group 1	Group 2	Group 3	Group 4	Group 5	
Baetidae	100%	100%	100%	100%	97%	0.99
Capniidae	78%	55%	50%	92%	68%	0.76
Chironomidae	100%	100%	100%	100%	95%	0.98
Chloroperlidae	78%	88%	94%	100%	100%	0.98
Ephemerellidae	78%	100%	100%	100%	100%	0.99
Heptageniidae	100%	100%	100%	100%	100%	1.00
Hydropsychidae	11%	92%	78%	92%	86%	0.84
Nemouridae	100%	100%	100%	100%	100%	1.00
Perlodidae	78%	78%	89%	92%	81%	0.86
Rhyacophilidae	100%	92%	100%	100%	95%	0.98
Taeniopterygidae	89%	49%	100%	92%	97%	0.94

RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	13.10
RIVPACS : Observed taxa P>0.50	9.00
RIVPACS : O:E (p > 0.5)	0.69
RIVPACS : Expected taxa P>0.70	10.33
RIVPACS : Observed taxa P>0.70	7.00
RIVPACS : O:E (p > 0.7)	0.68

Habitat Description

Variable	NHLAR01	Predicted Group Reference Mean ±SD
Bedrock Geology		
Alluvium (%)	0.00000	0.00000 ± 0.00000
Intrusive (%)	16.91766	11.07346 ± 28.63466
Metamorphic (%)	0.00000	17.96649 ± 35.53463
Sedimentary (%)	74.81858	70.96005 ± 44.90394
Ultramafic (%)	0.00000	0.00000 ± 0.00000
Volcanic (%)	8.26376	0.00000 ± 0.00000
Channel		
Depth-Avg (cm)	32.9	23.6 ± 11.1
Depth-BankfullMinusWetted (cm)	120.00	51.38 ± 29.42
Depth-Max (cm)	57.0	34.6 ± 12.3
Macrophyte (PercentRange)	0	0 ± 0
Reach-%CanopyCoverage (PercentRange)	1.00	1.33 ± 0.78
Reach-DomStreamsideVeg (Category (1-4))	4	4 ± 1
Reach-Pools (Binary)	0	1 ± 0
Reach-Rapids (Binary)	0	0 ± 0
Reach-Riffles (Binary)	1	1 ± 0
Reach-StraightRun (Binary)	1	1 ± 1
Slope (m/m)	0.0050000	0.0546683 ± 0.0376269
Veg-Coniferous (Binary)	1	1 ± 0
Veg-Deciduous (Binary)	1	1 ± 0
Veg-GrassesFerns (Binary)	1	1 ± 0
Veg-Shrubs (Binary)	1	1 ± 0
Velocity-Avg (m/s)	0.48	0.48 ± 0.22
Velocity-Max (m/s)	0.63	0.76 ± 0.36
Width-Bankfull (m)	28.0	13.4 ± 9.9
Width-Wetted (m)	23.0	8.5 ± 5.8
XSEC-VelMethod (Category (1-3))	1	1 ± 0
Climate		
Precip01_JAN (mm)	167.66667	104.85000 ± 26.28129

Habitat Description

Variable	NHLAR01	Predicted Group Reference Mean ±SD
Precip02_FEB (mm)	133.50000	83.66667 ± 27.10278
Precip03_MAR (mm)	111.75000	77.23611 ± 27.15950
Precip04_APR (mm)	167.66667	104.85000 ± 26.28129
Precip05_MAY (mm)	76.41667	71.65833 ± 17.81753
Precip06_JUN (mm)	94.16667	78.56667 ± 15.58521
Precip07_JUL (mm)	84.83333	64.39167 ± 10.41611
Precip08_AUG (mm)	83.25000	60.53056 ± 10.43373
Precip09_SEP (mm)	79.41667	56.91944 ± 10.91783
Precip10_OCT (mm)	109.58333	65.08056 ± 14.41229
Precip11_NOV (mm)	166.16667	105.93889 ± 25.04104
Precip12_DEC (mm)	179.33333	116.84444 ± 29.80954
PrecipTotal_ANNUAL (mm)	1366.75000	952.64722 ± 226.04690
Temp01_JANMax (Degrees Celsius)	-5.66667	-4.39167 ± 2.51268
Temp01_JANmin (Degrees Celsius)	-11.91667	-11.40833 ± 3.53951
Temp02_FEBmax (Degrees Celsius)	-2.58333	-1.70000 ± 2.12945
Temp02_FEBmin (Degrees Celsius)	-9.75000	-9.17500 ± 3.33361
Temp03_MARmax (Degrees Celsius)	0.91667	2.50556 ± 2.87525
Temp03_MARmin (Degrees Celsius)	-7.08333	-6.14167 ± 2.98556
Temp04_APRmax (Degrees Celsius)	5.33333	7.12222 ± 3.48771
Temp04_APRmin (Degrees Celsius)	-3.33333	-2.71667 ± 2.22785
Temp05_MAYmax (Degrees Celsius)	10.25000	12.03889 ± 3.55434
Temp05_MAYmin (Degrees Celsius)	0.25000	1.04722 ± 2.08663
Temp06_JUNMax (Degrees Celsius)	14.16667	15.72500 ± 3.40030
Temp06_JUNMin (Degrees Celsius)	3.08333	4.00278 ± 2.41085
Temp07_JULmax (Degrees Celsius)	17.91667	19.56111 ± 3.47275
Temp07_JULmin (Degrees Celsius)	5.41667	6.35833 ± 2.28332
Temp08_AUGmax (Degrees Celsius)	17.66667	19.52222 ± 3.51100
Temp08_AUGmin (Degrees Celsius)	5.41667	6.19167 ± 2.34422
Temp09_SEPmax (Degrees Celsius)	12.41667	14.04444 ± 3.03456
Temp09_SEPmin (Degrees Celsius)	1.66667	2.04722 ± 2.37208
Temp10_OCTmax (Degrees Celsius)	4.83333	6.88889 ± 2.71577
Temp10_OCTmin (Degrees Celsius)	-1.50000	-1.46111 ± 1.64316
Temp11_NOVmax (Degrees Celsius)	-2.08333	-0.79722 ± 2.43512
Temp11_NOVmin (Degrees Celsius)	-7.41667	-6.68056 ± 2.97163
Temp12_DECmax (Degrees Celsius)	-6.00000	-4.66389 ± 2.69757
Temp12_DECmin (Degrees Celsius)	-11.58333	-10.65833 ± 3.71739
TempANNUALmax (Degrees Celsius)	5.33333	6.96389 ± 3.06157
TempANNUALmean (Degrees Celsius)	0.91667	2.25278 ± 2.66574
TempANNUALmin (Degrees Celsius)	-2.58333	-2.18056 ± 2.41152
Hydrology		
Drainage-Area (km^2)	772.73506	124.42081 ± 200.99192
Perimeter (Km)	206.81843	64.71360 ± 56.15436
StreamDensity (m/km^2)	2058.99207	2246.06682 ± 604.89962
StreamLength (m)	1591055.37	302226.63 ± 500983.26
Landcover		
Natl-AnnCrops (%)	0.00000	0.00000 ± 0.00000
Natl-Barren (%)	0.00000	0.00000 ± 0.00000
Natl-BroadleafDense (%)	0.00000	0.00000 ± 0.00000
Natl-BroadleafOpen (%)	3.16174	1.19263 ± 2.03874
Natl-BroadleafSparse (%)	0.00000	0.00000 ± 0.00000
Natl-Coniferous (%)	0.00000	0.00000 ± 0.00000
Natl-ConiferousDense (%)	0.31039	0.64845 ± 0.37668
Natl-ConiferousOpen (%)	42.08616	54.62780 ± 18.30692
Natl-ConiferousSparse (%)	1.95565	0.94121 ± 1.53621
Natl-Deciduous (%)	0.00000	0.00000 ± 0.00000
Natl-Developed (%)	0.00000	0.00000 ± 0.00000
Natl-ExposedLand (%)	22.55306	13.20054 ± 11.11850
Natl-Grassland (%)	0.27699	1.87556 ± 1.68508
Natl-Herb (%)	9.19869	5.75738 ± 2.89836
Natl-MixedForest (%)	0.00000	0.00000 ± 0.00000
Natl-MixedwoodDense (%)	0.00000	0.00000 ± 0.00000
Natl-MixedwoodOpen (%)	0.09376	0.04060 ± 0.10208

Habitat Description

Variable	NHLAR01	Predicted Group Reference Mean ±SD
Natl-MixedwoodSparse (%)	0.00000	0.00000 ± 0.00000
Natl-PerennCropsPast (%)	0.00000	0.00000 ± 0.00000
Natl-Rock/Rubble (%)	0.66478	1.56403 ± 2.75979
Natl-Shrubland (%)	0.00000	0.00000 ± 0.00000
Natl-ShrubLow (%)	0.80711	4.98298 ± 3.22579
Natl-ShrubTall (%)	0.00000	0.00000 ± 0.00000
Natl-SnowIce (%)	1.18387	0.08491 ± 0.15475
Natl-Water (%)	3.75471	0.22916 ± 0.36834
Natl-Wetland (%)	0.00000	0.00000 ± 0.00000
Natl-WetlandHerb (%)	0.19387	0.12918 ± 0.35193
Natl-WetlandShrub (%)	0.04236	0.00000 ± 0.00000
Natl-WetlandTreed (%)	0.00000	0.00000 ± 0.00000
Reg-Ice (%)	0.77961	0.02487 ± 0.06034
Substrate Data		
%Bedrock (%)	0	0 ± 0
%Boulder (%)	3	9 ± 9
%Cobble (%)	79	51 ± 15
%Gravel (%)	1	3 ± 3
%Pebble (%)	17	37 ± 20
%Sand (%)	0	0 ± 0
%Silt+Clay (%)	0	0 ± 0
D50 (cm)	9.75	15.12 ± 14.26
Dg (cm)	9.3	8.2 ± 2.8
Dominant-1st (Category(0-9))	6	7 ± 1
Dominant-2nd (Category(0-9))	7	7 ± 1
Embeddedness (Category(1-5))	3	5 ± 1
PeriphytonCoverage (Category(1-5))	3	1 ± 0
SurroundingMaterial (Category(0-9))	3	4 ± 1
Topography		
ElevationMax (m)	2855.00000	2634.66667 ± 309.54023
ElevationMin (m)	698.00000	913.41667 ± 271.25180
ElevationStdev (m)	466.03423	349.02363 ± 92.12445
Reg-SlopeLT30% (%)	17.95613	18.88386 ± 9.29866
Slope30-50% (%)	28.51300	29.00215 ± 6.33837
Slope50-60% (%)	14.65308	13.91808 ± 1.91315
SlopeAvg (%)	51.87576	52.79851 ± 8.68755
SlopeGT60% (%)	35.44664	35.47207 ± 13.39684
SlopeLT30% (%)	21.38728	21.60770 ± 8.54172
SlopeMax (%)	417.85806	298.94390 ± 146.30679
SlopeMin (%)	0.00000	0.19777 ± 0.29213
SlopeStdev (%)	27.84970	26.57529 ± 4.62351
Water Chemistry		
General-DO (mg/L)	11.0000000	11.4175000 ± 0.7986708
General-pH (pH)	7.9	7.9 ± 0.4
General-SpCond (µS/cm)	105.0000000	168.9833333 ± 123.7858182
General-TempAir (Degrees Celsius)	13.5	26.0
General-TempWater (Degrees Celsius)	13.0000000	7.3183333 ± 2.7240839
General-Turbidity (NTU)	0.8500000	0.2020000