

Site Description

Study Name	CBWQ-Salmo
Site	NESLM03
Sampling Date	Oct 24 2013
Know Your Watershed Basin	Central Columbia
Province / Territory	British Columbia
Terrestrial Ecological Classification	Montane Cordillera EcoZone Columbia Mountains and Highlands EcoRegion
Coordinates (decimal degrees)	49.39086 N, 117.21055 W
Altitude	2979
Local Basin Name	Salmo River
	Columbia
Stream Order	6



Figure 1. Location Map

- Across Reach (No image found)
- Aerial (No image found)
- Down Stream (No image found)
- Field Sheet (No image found)
- Miscellaneous (No image found)
- Substrate (No image found)
- Up Stream (No image found)

Cabin Assessment Results

		Reference Model Summary				
Model	Columbia-Okanagan Preliminary March 2010					
Analysis Date	August 28, 2017					
Taxonomic Level	Family					
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	0.7%	4.0%	9.2%	82.0%	4.1%	
CABIN Assessment of NESLM03 on Oct 24, 2013	Similar to Reference					

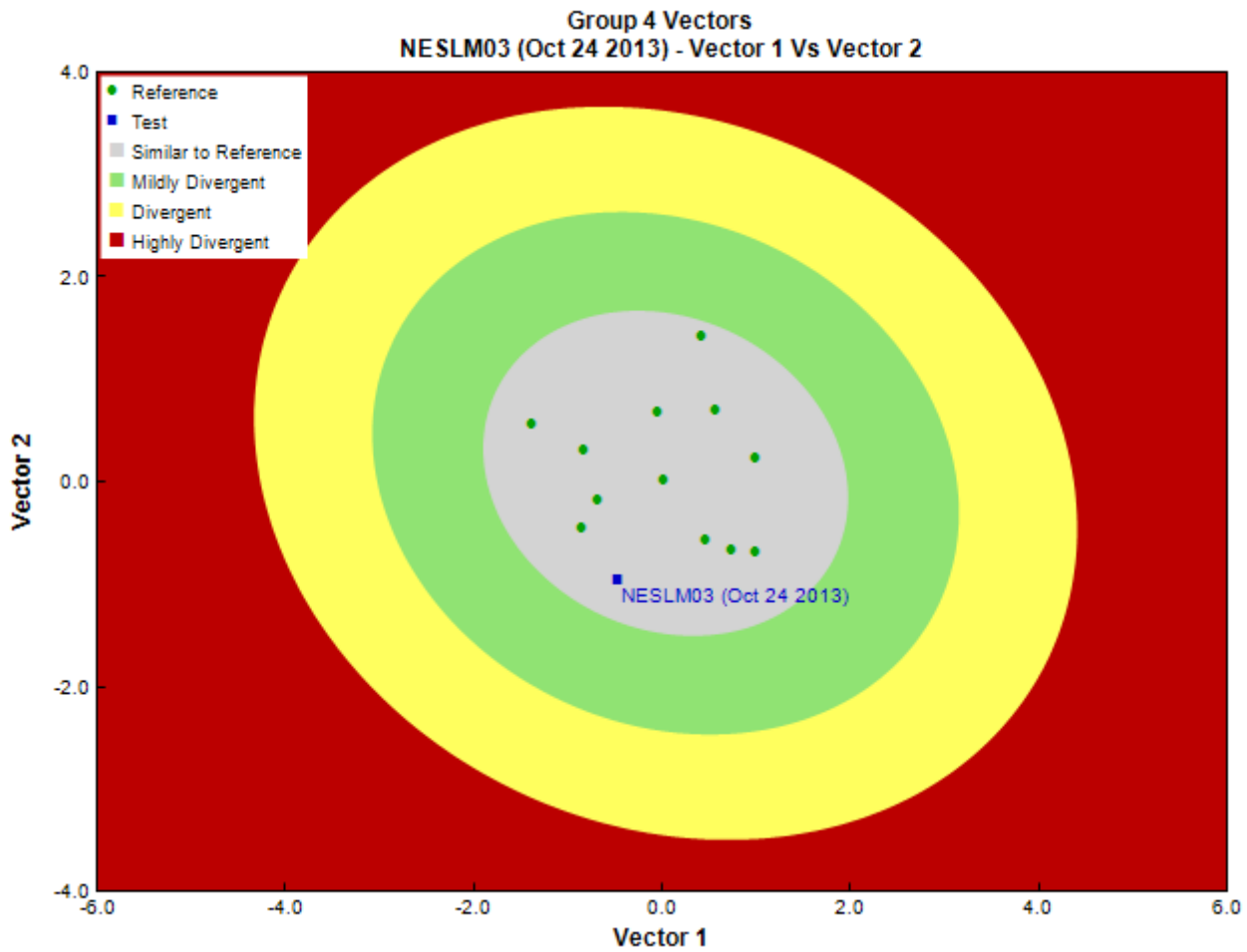


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

Sample Information

Sampling Device	Kick Net
Mesh Size	400
Sampling Time	3
Taxonomist	Pina Viola, Consultant
Date Taxonomy Completed	January 23, 2014
	Marchant Box
Sub-Sample Proportion	19/100

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count	
Annelida	Oligochaeta	Enchytraeida	Enchytraeidae	1	5.3	
		Tubificida		2	10.5	
Arthropoda	Insecta	Diptera	Trombidiformes	Hydryphantidae	1	5.3
				Lebertiidae	3	15.8
				Sperchontidae	1	5.3
				Torrenticolidae	2	10.6
				Elmidae	12	63.2
				Ceratopogonidae	1	5.3
				Chironomidae	67	352.6
				Empididae	1	5.3
				Psychodidae	1	5.3
				Simuliidae	1	5.3
				Tipulidae	4	21.1
	Ephemeroptera	Ameletidae	1	5.3		
		Baetidae	71	373.7		

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
			EphemereIIDae	21	110.6
			Heptageniidae	37	194.7
			Leptophlebiidae	1	5.3
		Plecoptera		6	31.6
			Capniidae	1	5.3
			Chloroperlidae	5	26.3
			Leuctridae	2	10.5
			Nemouridae	1	5.3
			Perlodidae	6	31.6
			Taeniopterygidae	46	242.1
		Trichoptera	Brachycentridae	2	10.5
			Glossosomatidae	5	26.3
			Hydropsychidae	1	5.3
			Lepidostomatidae	1	5.3
			Philopotamidae	1	5.3
			Rhyacophilidae	6	31.6
			Total	311	1,637.5

Metrics

Name	NESLM03	Predicted Group Reference Mean \pm SD
Bray-Curtis Distance	0.59	0.4 \pm 0.1
Biotic Indices		
Hilsenhoff Family index (North-West)	3.7	3.2 \pm 0.3
Intolerant taxa	--	
Long-lived taxa	2.0	2.1 \pm 1.0
Tolerant individuals (%)	--	0.8 \pm 0.3
Functional Measures		
% Filterers	1.6	2.2 \pm 1.8
% Gatherers	52.4	38.4 \pm 12.4
% Predatores	30.5	19.0 \pm 8.5
% Scrapers	57.2	63.2 \pm 19.7
% Shredder	22.2	27.6 \pm 15.2
Number Of Individuals		
% Chironomidae	22.1	7.4 \pm 6.4
% Coleoptera	4.0	1.5 \pm 3.9
% Diptera + Non-insects	27.4	10.8 \pm 7.6
% Ephemeroptera	43.2	51.7 \pm 18.8
% Ephemeroptera that are Baetidae	54.2	40.6 \pm 30.0
% EPT Individuals	68.6	87.7 \pm 7.4
% Odonata	--	0.0 \pm 0.0
% of 2 dominant taxa	45.5	57.9 \pm 14.2
% of 5 dominant taxa	79.9	81.6 \pm 7.9
% of dominant taxa	23.4	39.8 \pm 14.9
% Plecoptera	20.1	31.4 \pm 15.4
% Tribe Tanyatarisini	--	
% Trichoptera that are Hydropsychida	6.2	27.0 \pm 26.2
% Tricoptera	5.3	4.5 \pm 2.8
No. EPT individuals/Chironomids+EPT Individuals	0.8	0.9 \pm 0.1
Total Abundance	1636.8	587.4 \pm 299.1
Richness		
Chironomidae taxa (genus level only)	1.0	1.0 \pm 0.0
Coleoptera taxa	1.0	0.4 \pm 0.5
Diptera taxa	6.0	3.3 \pm 1.0
Ephemeroptera taxa	5.0	3.8 \pm 0.8
EPT Individuals (Sum)	1094.7	526.0 \pm 285.8
EPT taxa (no)	17.0	13.3 \pm 2.7
Odonata taxa	--	0.0 \pm 0.0
Pielou's Evenness	0.7	0.7 \pm 0.1
Plecoptera taxa	6.0	6.3 \pm 1.1
Shannon-Wiener Diversity	2.3	1.9 \pm 0.4
Simpson's Diversity	0.8	0.8 \pm 0.1

Metrics

Name	NESLM03	Predicted Group Reference Mean \pm SD
Simpson's Evenness	0.2	0.3 \pm 0.1
Total No. of Taxa	29.0	19.3 \pm 3.7
Trichoptera taxa	6.0	3.2 \pm 1.4

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NESLM03
	Group 1	Group 2	Group 3	Group 4	Group 5	
Baetidae	100%	100%	100%	100%	97%	1.00
Capniidae	78%	55%	50%	92%	68%	0.85
Chironomidae	100%	100%	100%	100%	95%	1.00
Chloroperlidae	78%	88%	94%	100%	100%	0.99
EphemereIIDae	78%	100%	100%	100%	100%	1.00
Heptageniidae	100%	100%	100%	100%	100%	1.00
Hydropsychidae	11%	92%	78%	92%	86%	0.90
Nemouridae	100%	100%	100%	100%	100%	1.00
Perlidae	11%	84%	33%	100%	3%	0.89
Perlodidae	78%	78%	89%	92%	81%	0.90
Rhyacophilidae	100%	92%	100%	100%	95%	0.99
Taeniopterygidae	89%	49%	100%	92%	97%	0.91

RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	13.87
RIVPACS : Observed taxa P>0.50	15.00
RIVPACS : O:E (p > 0.5)	1.08
RIVPACS : Expected taxa P>0.70	11.43
RIVPACS : Observed taxa P>0.70	11.00
RIVPACS : O:E (p > 0.7)	0.96

Habitat Description

Variable	NESLM03	Predicted Group Reference Mean \pm SD
Bedrock Geology		
Alluvium (%)	0.00000	0.00000 \pm 0.00000
Intrusive (%)	36.14017	11.07346 \pm 28.63466
Metamorphic (%)	0.00000	17.96649 \pm 35.53463
Sedimentary (%)	50.65375	70.96005 \pm 44.90394
Ultramafic (%)	0.00000	0.00000 \pm 0.00000
Volcanic (%)	13.20608	0.00000 \pm 0.00000
Channel		
Depth-Avg (cm)	36.8	23.6 \pm 11.1
Depth-BankfullMinusWetted (cm)	180.00	51.38 \pm 29.42
Depth-Max (cm)	50.0	34.6 \pm 12.3
Macrophyte (PercentRange)	1	0 \pm 0
Reach-%CanopyCoverage (PercentRange)	1.00	1.33 \pm 0.78
Reach-DomStreamsideVeg (Category (1-4))	3	4 \pm 1
Reach-Pools (Binary)	1	1 \pm 0
Reach-Rapids (Binary)	1	0 \pm 0
Reach-Riffles (Binary)	1	1 \pm 0
Reach-StraightRun (Binary)	1	1 \pm 1
Slope (m/m)	0.0300000	0.0546683 \pm 0.0376269
Veg-Coniferous (Binary)	1	1 \pm 0
Veg-Deciduous (Binary)	1	1 \pm 0
Veg-GrassesFerns (Binary)	1	1 \pm 0
Veg-Shrubs (Binary)	1	1 \pm 0
Velocity-Avg (m/s)	0.32	0.48 \pm 0.22
Velocity-Max (m/s)	0.57	0.76 \pm 0.36
Width-Bankfull (m)	21.0	13.4 \pm 9.9
Width-Wetted (m)	12.0	8.5 \pm 5.8
XSEC-VelInstrumentDirect (Category (1-3))	3	0 \pm 0

Habitat Description

Variable	NESLM03	Predicted Group Reference Mean \pm SD
XSEC-VelMethod (Category (1-3))	3	1 \pm 0
Climate		
Precip01_JAN (mm)	131.00000	104.85000 \pm 26.28129
Precip02_FEB (mm)	113.00000	83.66667 \pm 27.10278
Precip03_MAR (mm)	106.00000	77.23611 \pm 27.15950
Precip04_APR (mm)	131.00000	104.85000 \pm 26.28129
Precip05_MAY (mm)	96.00000	71.65833 \pm 17.81753
Precip06_JUN (mm)	98.00000	78.56667 \pm 15.58521
Precip07_JUL (mm)	73.00000	64.39167 \pm 10.41611
Precip08_AUG (mm)	68.00000	60.53056 \pm 10.43373
Precip09_SEP (mm)	69.00000	56.91944 \pm 10.91783
Precip10_OCT (mm)	82.00000	65.08056 \pm 14.41229
Precip11_NOV (mm)	135.00000	105.93889 \pm 25.04104
Precip12_DEC (mm)	148.00000	116.84444 \pm 29.80954
PrecipTotal_ANNUAL (mm)	1209.00000	952.64722 \pm 226.04690
Temp01_JANMax (Degrees Celsius)	-4.00000	-4.39167 \pm 2.51268
Temp01_JANmin (Degrees Celsius)	-10.00000	-11.40833 \pm 3.53951
Temp02_FEBmax (Degrees Celsius)	-2.00000	-1.70000 \pm 2.12945
Temp02_FEBmin (Degrees Celsius)	-8.00000	-9.17500 \pm 3.33361
Temp03_MARmax (Degrees Celsius)	2.00000	2.50556 \pm 2.87525
Temp03_MARmin (Degrees Celsius)	-6.00000	-6.14167 \pm 2.98556
Temp04_APRmax (Degrees Celsius)	6.00000	7.12222 \pm 3.48771
Temp04_APRmin (Degrees Celsius)	-2.00000	-2.71667 \pm 2.22785
Temp05_MAYmax (Degrees Celsius)	11.00000	12.03889 \pm 3.55434
Temp05_MAYmin (Degrees Celsius)	1.00000	1.04722 \pm 2.08663
Temp06_JUNMax (Degrees Celsius)	15.00000	15.72500 \pm 3.40030
Temp06_JUNMin (Degrees Celsius)	4.00000	4.00278 \pm 2.41085
Temp07_JULmax (Degrees Celsius)	19.00000	19.56111 \pm 3.47275
Temp07_JULmin (Degrees Celsius)	7.00000	6.35833 \pm 2.28332
Temp08_AUGmax (Degrees Celsius)	19.00000	19.52222 \pm 3.51100
Temp08_AUGmin (Degrees Celsius)	7.00000	6.19167 \pm 2.34422
Temp09_SEPmax (Degrees Celsius)	13.00000	14.04444 \pm 3.03456
Temp09_SEPmin (Degrees Celsius)	2.00000	2.04722 \pm 2.37208
Temp10_OCTmax (Degrees Celsius)	6.00000	6.88889 \pm 2.71577
Temp10_OCTmin (Degrees Celsius)	-1.00000	-1.46111 \pm 1.64316
Temp11_NOVmax (Degrees Celsius)	-1.00000	-0.79722 \pm 2.43512
Temp11_NOVmin (Degrees Celsius)	-6.00000	-6.68056 \pm 2.97163
Temp12_DECmax (Degrees Celsius)	-5.00000	-4.66389 \pm 2.69757
Temp12_DECmin (Degrees Celsius)	-10.00000	-10.65833 \pm 3.71739
TempANNUALmax (Degrees Celsius)	6.00000	6.96389 \pm 3.06157
TempANNUALmean (Degrees Celsius)	2.00000	2.25278 \pm 2.66574
TempANNUALmin (Degrees Celsius)	-2.00000	-2.18056 \pm 2.41152
Hydrology		
Drainage-Area (km ²)	85.56487	124.42081 \pm 200.99192
Perimeter (Km)	57.72655	64.71360 \pm 56.15436
StreamDensity (m/km ²)	1723.24458	2246.06682 \pm 604.89962
StreamLength (m)	147449.20	302226.63 \pm 500983.26
Landcover		
Natl-AnnCrops (%)	0.00000	0.00000 \pm 0.00000
Natl-Barren (%)	0.00000	0.00000 \pm 0.00000
Natl-BroadleafDense (%)	0.00000	0.00000 \pm 0.00000
Natl-BroadleafOpen (%)	0.53443	1.19263 \pm 2.03874
Natl-BroadleafSparse (%)	0.00000	0.00000 \pm 0.00000
Natl-Coniferous (%)	0.00000	0.00000 \pm 0.00000
Natl-ConiferousDense (%)	0.23635	0.64845 \pm 0.37668
Natl-ConiferousOpen (%)	65.98769	54.62780 \pm 18.30692
Natl-ConiferousSparse (%)	0.00000	0.94121 \pm 1.53621
Natl-Deciduous (%)	0.00000	0.00000 \pm 0.00000
Natl-Developed (%)	0.00000	0.00000 \pm 0.00000
Natl-ExposedLand (%)	5.25134	13.20054 \pm 11.11850
Natl-Grassland (%)	0.00000	1.87556 \pm 1.68508
Natl-Herb (%)	9.69604	5.75738 \pm 2.89836

Habitat Description

Variable	NESLM03	Predicted Group Reference Mean \pm SD
Natl-MixedForest (%)	0.00000	0.00000 \pm 0.00000
Natl-MixedwoodDense (%)	0.00000	0.00000 \pm 0.00000
Natl-MixedwoodOpen (%)	0.00000	0.04060 \pm 0.10208
Natl-MixedwoodSparse (%)	0.00000	0.00000 \pm 0.00000
Natl-PerennCropsPast (%)	0.00000	0.00000 \pm 0.00000
Natl-Rock/Rubble (%)	0.00000	1.56403 \pm 2.75979
Natl-Shrubland (%)	0.00000	0.00000 \pm 0.00000
Natl-ShrubLow (%)	10.33038	4.98298 \pm 3.22579
Natl-ShrubTall (%)	0.00000	0.00000 \pm 0.00000
Natl-SnowIce (%)	0.00000	0.08491 \pm 0.15475
Natl-Water (%)	0.07483	0.22916 \pm 0.36834
Natl-Wetland (%)	0.00000	0.00000 \pm 0.00000
Natl-WetlandHerb (%)	0.02063	0.12918 \pm 0.35193
Natl-WetlandShrub (%)	0.04669	0.00000 \pm 0.00000
Natl-WetlandTreed (%)	0.00000	0.00000 \pm 0.00000
Reg-Ice (%)	0.00000	0.02487 \pm 0.06034
Substrate Data		
%Bedrock (%)	0	0 \pm 0
%Boulder (%)	0	9 \pm 9
%Cobble (%)	36	51 \pm 15
%Gravel (%)	20	3 \pm 3
%Pebble (%)	43	37 \pm 20
%Sand (%)	1	0 \pm 0
%Silt+Clay (%)	0	0 \pm 0
D50 (cm)	4.00	15.12 \pm 14.26
Dg (cm)	3.8	8.2 \pm 2.8
Dominant-1st (Category(0-9))	5	7 \pm 1
Dominant-2nd (Category(0-9))	6	7 \pm 1
Embeddedness (Category(1-5))	5	5 \pm 1
PeriphytonCoverage (Category(1-5))	3	1 \pm 0
SurroundingMaterial (Category(0-9))	6	4 \pm 1
Topography		
ElevationMax (m)	2356.00000	2634.66667 \pm 309.54023
ElevationMin (m)	898.00000	913.41667 \pm 271.25180
ElevationStdev (m)	299.19129	349.02363 \pm 92.12445
Reg-SlopeLT30% (%)	18.39000	18.88386 \pm 9.29866
Slope30-50% (%)	33.84156	29.00215 \pm 6.33837
Slope50-60% (%)	16.02361	13.91808 \pm 1.91315
SlopeAvg (%)	47.89136	52.79851 \pm 8.68755
SlopeGT60% (%)	28.04157	35.47207 \pm 13.39684
SlopeLT30% (%)	22.09326	21.60770 \pm 8.54172
SlopeMax (%)	183.77261	298.94390 \pm 146.30679
SlopeMin (%)	0.00000	0.19777 \pm 0.29213
SlopeStdev (%)	21.86721	26.57529 \pm 4.62351
Water Chemistry		
General-DO (mg/L)	11.0000000	11.4175000 \pm 0.7986708
General-pH (pH)	9.0	7.9 \pm 0.4
General-SpCond (μ S/cm)	69.0000000	168.9833333 \pm 123.7858182
General-TempAir (Degrees Celsius)	12.7	26.0
General-TempWater (Degrees Celsius)	4.8000000	7.3183333 \pm 2.7240839
General-Turbidity (NTU)	0.5600000	0.2020000
Nitrogen-NO2 (mg/L)	0.0025000	0.0027500 \pm 0.0062831
Nitrogen-NO2+NO3 (mg/L)	0.0580000	0.0690000
Nitrogen-NO3 (mg/L)	0.0580000	0.0546667 \pm 0.0498148
Phosphorus-OrthoP (mg/L)	0.0025000	0.0002727 \pm 0.0004671