

Site Description

Study Name	CBWQ-Upper Columbia
Site	NAHOR02
Sampling Date	Sep 17 2009
Know Your Watershed Basin	Upper Columbia
Province / Territory	British Columbia
Terrestrial Ecological Classification	Montane Cordillera EcoZone Southern Rocky Mountain Trench EcoRegion
Coordinates (decimal degrees)	51.21306 N, 116.89194 W
Altitude	2936
Local Basin Name	Horse Cr
	Columbia
Stream Order	4



Figure 1. Location Map



Across Reach
Aerial (No image found)



Down Stream

CABIN
Field Crew Rachel DeWitt / Devin DeWitt / Barbara Site Code: NDW0202
Sampling Date (D/M/Y) 12 / 09 / 2009 QA/QC site: Yes No
S: Site Inspection Sheet Completed
Primary Site Data CABIN Study Name: _____
Basin name: _____ Ecoregion: _____
Stream Name Horse Creek Stream Order (map scale 1:50,000): _____
"Indicate if other map scale used"
Topical description/notes: about 100m from junction with Hwy 1 at Horse Creek Bridge, about 100m upstream
Land Use: (check those present) _____ Information source: _____

Field Sheet



Miscellaneous



Substrate



Up Stream

Cabin Assessment Results

Reference Model Summary	
Model	Columbia-Okanagan Preliminary March 2010
Analysis Date	November 01, 2017
Taxonomic Level	Family
Predictive Model Variables	Depth-Avg Latitude Longitude Reg-Ice Reg-SlopeLT30%
Reference Groups	
Number of Reference Sites	1 9 2 43 3 17 4 12 5 33
Group Error Rate	22.2% 24.5% 22.2% 25.0% 32.4%
Overall Model Error Rate	26.4%
Probability of Group Membership	0.1% 0.1% 6.9% 10.9% 82.0%
CABIN Assessment of NAHOR02 on Sep 17, 2009	Similar to Reference

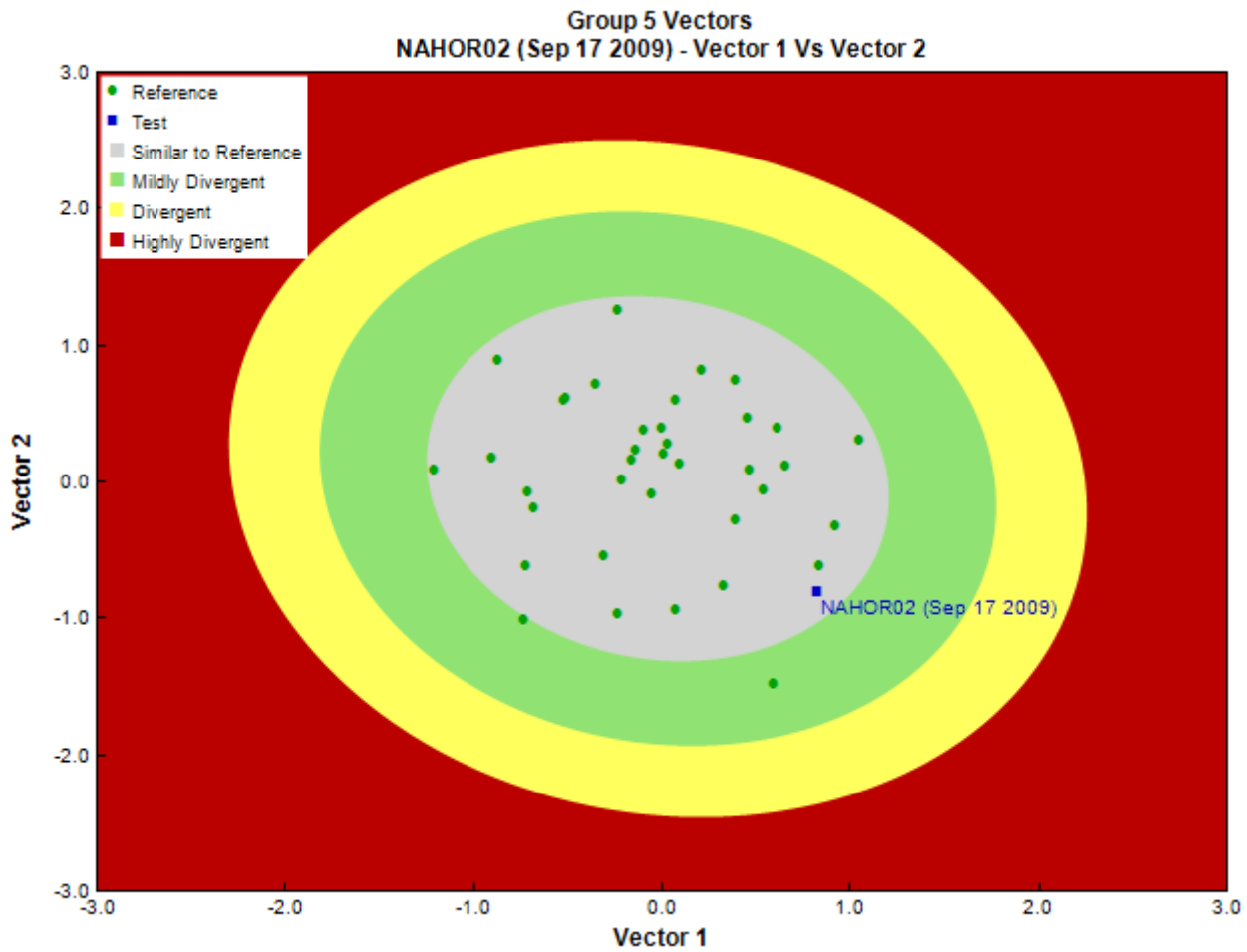


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

Sample Information

Sampling Device	Kick Net
Mesh Size	400
Sampling Time	3
Taxonomist	Eco Analysts, EcoAnalysts
Date Taxonomy Completed	February 26, 2010
	Marchant Box
Sub-Sample Proportion	45/100

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count	
Arthropoda	Arachnida			1	2.2	
		Insecta	Diptera	Chironomidae	46	102.2
				Empididae	7	15.6
			Ephemeroptera	Ameletidae	2	4.4
				Baetidae	8	17.8
				Ephemerellidae	1	2.2
				Heptageniidae	40	88.9
			Plecoptera	Capniidae	7	15.6
				Chloroperlidae	5	11.1
				Leuctridae	1	2.2
				Nemouridae	83	184.4
				Perlodidae	3	6.7
				Taeniopterygidae	95	211.1
			Trichoptera	Hydropsychidae	3	6.7
				Limnephilidae	1	2.2

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
			Rhyacophilidae	6	13.3
			Total	309	686.6

Metrics

Name	NAHOR02	Predicted Group Reference Mean \pm SD
Bray-Curtis Distance	0.47	0.4 \pm 0.1
Biotic Indices		
Hilsenhoff Family index (North-West)	2.9	2.8 \pm 0.3
Intolerant taxa	--	1.0 \pm 0.0
Long-lived taxa	--	1.0 \pm 0.0
Tolerant individuals (%)	--	0.3
Functional Measures		
% Filterers	1.0	1.7 \pm 1.7
% Gatherers	75.1	50.6 \pm 14.6
% Predatores	22.7	15.3 \pm 9.0
% Scrapers	48.2	67.2 \pm 16.8
% Shredder	60.5	38.1 \pm 18.2
No. Clinger Taxa	12.0	19.8 \pm 3.4
Number Of Individuals		
% Chironomidae	14.9	4.6 \pm 5.0
% Coleoptera	0.0	0.0 \pm 0.0
% Diptera + Non-insects	17.2	6.3 \pm 5.3
% Ephemeroptera	16.6	44.9 \pm 17.3
% Ephemeroptera that are Baetidae	15.7	26.1 \pm 20.5
% EPT Individuals	82.8	93.7 \pm 5.3
% Odonata	--	0.0 \pm 0.0
% of 2 dominant taxa	57.8	60.2 \pm 11.4
% of 5 dominant taxa	88.3	84.5 \pm 5.9
% of dominant taxa	30.8	39.3 \pm 12.3
% Plecoptera	63.0	42.9 \pm 17.2
% Tribe Tanyatarisini	--	
% Trichoptera that are Hydropsychida	30.0	27.4 \pm 27.1
% Tricoptera	3.2	5.8 \pm 5.7
No. EPT individuals/Chironomids+EPT Individuals	0.8	1.0 \pm 0.1
Total Abundance	686.6	2163.6 \pm 1274.4
Richness		
Chironomidae taxa (genus level only)	1.0	0.9 \pm 0.2
Coleoptera taxa	0.0	0.1 \pm 0.2
Diptera taxa	2.0	2.4 \pm 1.0
Ephemeroptera taxa	4.0	3.7 \pm 0.5
EPT Individuals (Sum)	566.6	2023.9 \pm 1195.7
EPT taxa (no)	13.0	12.3 \pm 1.9
Odonata taxa	--	0.0 \pm 0.0
Pielou's Evenness	0.7	0.7 \pm 0.1
Plecoptera taxa	6.0	5.5 \pm 1.1
Shannon-Wiener Diversity	1.9	1.9 \pm 0.3
Simpson's Diversity	0.8	0.8 \pm 0.1
Simpson's Evenness	0.3	0.3 \pm 0.1
Total No. of Taxa	15.0	16.0 \pm 3.0
Trichoptera taxa	3.0	3.2 \pm 1.0

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NAHOR02
	Group 1	Group 2	Group 3	Group 4	Group 5	
Baetidae	100%	100%	100%	100%	97%	0.98
Chironomidae	100%	100%	100%	100%	95%	0.96
Chloroperlidae	78%	88%	94%	100%	100%	1.00
Ephemerellidae	78%	100%	100%	100%	100%	1.00
Heptageniidae	100%	100%	100%	100%	100%	1.00
Hydropsychidae	11%	92%	78%	92%	86%	0.86

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NAHOR02
	Group 1	Group 2	Group 3	Group 4	Group 5	
Nemouridae	100%	100%	100%	100%	100%	1.00
Perlodidae	78%	78%	89%	92%	81%	0.83
Rhyacophilidae	100%	92%	100%	100%	95%	0.96
Taeniopterygidae	89%	49%	100%	92%	97%	0.97

RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	12.60
RIVPACS : Observed taxa P>0.50	14.00
RIVPACS : O:E (p > 0.5)	1.11
RIVPACS : Expected taxa P>0.70	9.54
RIVPACS : Observed taxa P>0.70	10.00
RIVPACS : O:E (p > 0.7)	1.05

Habitat Description

Variable	NAHOR02	Predicted Group Reference Mean \pm SD
Bedrock Geology		
Alluvium (%)	0.00000	0.00000 \pm 0.00000
Intrusive (%)	0.00000	0.46153 \pm 2.09955
Metamorphic (%)	0.00000	0.17691 \pm 0.85012
Sedimentary (%)	100.00000	99.36155 \pm 2.22799
Ultramafic (%)	0.00000	0.00000 \pm 0.00000
Volcanic (%)	0.00000	0.00000 \pm 0.00000
Channel		
Depth-Avg (cm)	13.7	21.5 \pm 9.7
Depth-BankfullMinusWetted (cm)	18.20	38.14 \pm 36.11
Depth-Max (cm)	16.5	31.0 \pm 16.5
Macrophyte (PercentRange)	0	0 \pm 0
Reach-%CanopyCoverage (PercentRange)	1.00	1.54 \pm 1.28
Reach-DomStreamsideVeg (Category (1-4))	3	3 \pm 1
Reach-Pools (Binary)	0	1 \pm 0
Reach-Rapids (Binary)	0	0 \pm 0
Reach-Riffles (Binary)	1	1 \pm 0
Reach-StraightRun (Binary)	1	0 \pm 1
Slope (m/m)	0.0380000	0.0581357 \pm 0.0554952
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)	0.73	0.51 \pm 0.27
Velocity-Max (m/s)	0.87	0.78 \pm 0.40
Width-Bankfull (m)	5.7	13.7 \pm 16.4
Width-Wetted (m)	2.2	9.0 \pm 13.1
XSEC-VelMethod (Category (1-3))	1	2 \pm 1
Climate		
Precip01_JAN (mm)	83.00000	130.45668 \pm 67.17180
Precip02_FEB (mm)	54.00000	102.48242 \pm 52.12836
Precip03_MAR (mm)	40.00000	89.80929 \pm 42.79174
Precip04_APR (mm)	83.00000	135.11134 \pm 66.06707
Precip05_MAY (mm)	46.00000	70.51109 \pm 13.79432
Precip06_JUN (mm)	60.00000	86.65922 \pm 19.93623
Precip07_JUL (mm)	61.00000	79.11475 \pm 19.88523
Precip08_AUG (mm)	58.00000	76.86606 \pm 21.34619
Precip09_SEP (mm)	51.00000	71.16784 \pm 23.11306
Precip10_OCT (mm)	56.00000	88.14083 \pm 44.84739
Precip11_NOV (mm)	78.00000	134.64587 \pm 63.61897
Precip12_DEC (mm)	87.00000	142.32359 \pm 65.85239
PrecipTotal_ANNUAL (mm)	714.00000	1143.02476 \pm 453.62461
Temp01_JANMax (Degrees Celsius)	-6.00000	-6.18206 \pm 1.69263
Temp01_JANmin (Degrees Celsius)	-13.00000	-13.62029 \pm 2.05208

Habitat Description

Variable	NAHOR02	Predicted Group Reference Mean \pm SD
Temp02_FEBmax (Degrees Celsius)	-1.00000	-2.89816 \pm 1.88421
Temp02_FEBmin (Degrees Celsius)	-10.00000	-11.14625 \pm 1.99282
Temp03_MARmax (Degrees Celsius)	4.00000	0.98920 \pm 2.35950
Temp03_MARmin (Degrees Celsius)	-6.00000	-7.98295 \pm 1.94687
Temp04_APRmax (Degrees Celsius)	10.00000	5.37616 \pm 3.02243
Temp04_APRmin (Degrees Celsius)	-2.00000	-3.74673 \pm 1.66191
Temp05_MAYmax (Degrees Celsius)	15.00000	10.12548 \pm 3.18022
Temp05_MAYmin (Degrees Celsius)	1.00000	0.09616 \pm 1.15628
Temp06_JUNmax (Degrees Celsius)	19.00000	13.85415 \pm 3.23839
Temp06_JUNmin (Degrees Celsius)	5.00000	2.79527 \pm 1.60213
Temp07_JULmax (Degrees Celsius)	22.00000	17.45582 \pm 3.27590
Temp07_JULmin (Degrees Celsius)	7.00000	4.99257 \pm 1.52992
Temp08_AUGmax (Degrees Celsius)	22.00000	17.36896 \pm 3.11866
Temp08_AUGmin (Degrees Celsius)	6.00000	4.84827 \pm 1.46649
Temp09_SEPmax (Degrees Celsius)	16.00000	12.13974 \pm 2.86510
Temp09_SEPmin (Degrees Celsius)	2.00000	1.12535 \pm 1.20660
Temp10_OCTmax (Degrees Celsius)	8.00000	5.04078 \pm 2.46521
Temp10_OCTmin (Degrees Celsius)	-1.00000	-2.41023 \pm 1.18961
Temp11_NOVmax (Degrees Celsius)	0.00000	-2.24818 \pm 1.93047
Temp11_NOVmin (Degrees Celsius)	-7.00000	-8.35137 \pm 1.96467
Temp12_DECmax (Degrees Celsius)	-6.00000	-6.49458 \pm 1.76429
Temp12_DECmin (Degrees Celsius)	-12.00000	-12.72330 \pm 1.87798
TempANNUALmax (Degrees Celsius)	8.00000	5.16639 \pm 2.57569
TempANNUALmean (Degrees Celsius)	3.00000	0.71683 \pm 1.81248
TempANNUALmin (Degrees Celsius)	-2.00000	-3.38604 \pm 1.60598
Hydrology		
Drainage-Area (km ²)	23.84194	135.66658 \pm 373.96803
Perimeter (Km)	34.59989	55.78285 \pm 83.00734
StreamDensity (m/km ²)	2757.66254	2198.74079 \pm 886.68339
StreamLength (m)	65748.03	293250.33 \pm 851854.38
Landcover		
Natl-AnnCrops (%)	0.00000	0.00000 \pm 0.00000
Natl-Barren (%)	0.00000	0.00000 \pm 0.00000
Natl-BroadleafDense (%)	0.00000	0.00523 \pm 0.02638
Natl-BroadleafOpen (%)	1.66113	1.35705 \pm 2.04550
Natl-BroadleafSparse (%)	0.00000	0.31953 \pm 0.53788
Natl-Coniferous (%)	0.00000	0.00000 \pm 0.00000
Natl-ConiferousDense (%)	2.08345	4.95677 \pm 7.46543
Natl-ConiferousOpen (%)	45.69524	34.34335 \pm 18.65764
Natl-ConiferousSparse (%)	5.63003	1.39163 \pm 1.60111
Natl-Deciduous (%)	0.00000	0.00000 \pm 0.00000
Natl-Developed (%)	0.00000	0.00002 \pm 0.00009
Natl-ExposedLand (%)	10.98581	16.95282 \pm 9.64125
Natl-Grassland (%)	8.24811	5.60615 \pm 5.17505
Natl-Herb (%)	0.24413	2.04978 \pm 2.79736
Natl-MixedForest (%)	0.00000	0.00000 \pm 0.00000
Natl-MixedwoodDense (%)	0.15478	0.02636 \pm 0.08976
Natl-MixedwoodOpen (%)	9.58942	2.10440 \pm 2.63686
Natl-MixedwoodSparse (%)	0.00000	0.01817 \pm 0.04448
Natl-PerennCropsPast (%)	0.00000	0.00000 \pm 0.00000
Natl-Rock/Rubble (%)	3.31291	6.97447 \pm 7.52078
Natl-Shrubland (%)	0.00000	0.00000 \pm 0.00000
Natl-ShrubLow (%)	6.49920	4.49178 \pm 5.44294
Natl-ShrubTall (%)	0.00000	0.33533 \pm 1.14136
Natl-SnowIce (%)	0.00000	7.70046 \pm 9.06096
Natl-Water (%)	0.00000	0.14384 \pm 0.45543
Natl-Wetland (%)	0.00000	0.00000 \pm 0.00000
Natl-WetlandHerb (%)	0.00000	0.00639 \pm 0.02401
Natl-WetlandShrub (%)	0.00000	0.00868 \pm 0.02574
Natl-WetlandTreed (%)	0.00000	0.00226 \pm 0.00959
Reg-Ice (%)	0.00000	3.06094 \pm 5.65390
Substrate Data		

Habitat Description

Variable	NAHOR02	Predicted Group Reference Mean \pm SD
%Bedrock (%)	0	1 \pm 1
%Boulder (%)	1	3 \pm 3
%Cobble (%)	45	64 \pm 17
%Gravel (%)	2	2 \pm 2
%Pebble (%)	52	31 \pm 16
%Sand (%)	0	0 \pm 0
%Silt+Clay (%)	0	0 \pm 0
D50 (cm)	6.00	19.61 \pm 30.65
Dg (cm)	5.9	20.3 \pm 30.8
Dominant-1st (Category(0-9))	6	7 \pm 1
Dominant-2nd (Category(0-9))	5	6 \pm 1
Embeddedness (Category(1-5))	5	4 \pm 1
PeriphytonCoverage (Category(1-5))	2	2 \pm 1
SurroundingMaterial (Category(0-9))	3	3 \pm 1
Topography		
ElevationMax (m)	2586.00000	2829.64865 \pm 315.67549
ElevationMin (m)	811.00000	1172.81081 \pm 249.32284
ElevationStdev (m)	365.04788	342.56455 \pm 77.02221
Reg-SlopeLT30% (%)	8.99700	16.26604 \pm 8.50298
Slope30-50% (%)	27.62815	28.13773 \pm 4.86732
Slope50-60% (%)	16.16695	14.11202 \pm 1.82185
SlopeAvg (%)	55.87465	56.75540 \pm 7.27461
SlopeGT60% (%)	41.06465	39.57775 \pm 9.82818
SlopeLT30% (%)	15.14024	18.17250 \pm 6.88627
SlopeMax (%)	229.09795	317.81636 \pm 141.61151
SlopeMin (%)	0.59331	0.79557 \pm 1.30240
SlopeStdev (%)	24.97949	29.56849 \pm 5.64880
Water Chemistry		
Ca (mg/L)	49.7000000	23.0705882 \pm 17.1292507
General-Alkalinity (mg/L)	170.0000000	68.5944444 \pm 52.1098452
General-Conductivity (μ S/cm)	390.0000000	110.5428571 \pm 89.3409737
General-DO (mg/L)	0.0000000	11.0635135 \pm 0.9899052
General-Hardness (mg/L)	214.0000000	88.7500000 \pm 65.9614844
General-pH (pH)	8.2	7.7 \pm 0.7
General-SolidsTSS (mg/L)	2.0000000	2.8140173 \pm 7.8143482
General-TempAir (Degrees Celsius)	13.9	10.5 \pm 0.7
General-TempWater (Degrees Celsius)	9.9000000	5.5262162 \pm 1.8860693
Mg (mg/L)	21.7000000	7.6670588 \pm 6.3323257
Nitrogen-TN (mg/L)	0.0400000	0.0983333 \pm 0.0651811
Phosphorus-TP (mg/L)	0.0025000	0.0025000 \pm 0.0041986

Site Description

Study Name	CBWQ-Upper Columbia
Site	NAHOR02
Sampling Date	Sep 28 2010
Know Your Watershed Basin	Upper Columbia
Province / Territory	British Columbia
Terrestrial Ecological Classification	Montane Cordillera EcoZone Southern Rocky Mountain Trench EcoRegion
Coordinates (decimal degrees)	51.21306 N, 116.89194 W
Altitude	2936
Local Basin Name	Horse Cr
	Columbia
Stream Order	4



Figure 1. Location Map



Across Reach
Aerial (No image found)



Down Stream

Field Sheet

Field Code: 00010 Before: 01/17/2017 After: 01/17/2017 Site Code: 00010
 Sampling Date (DMWY): 01/17/2017 No Yes No Yes No

OHS: Site Inspection Sheet Completed

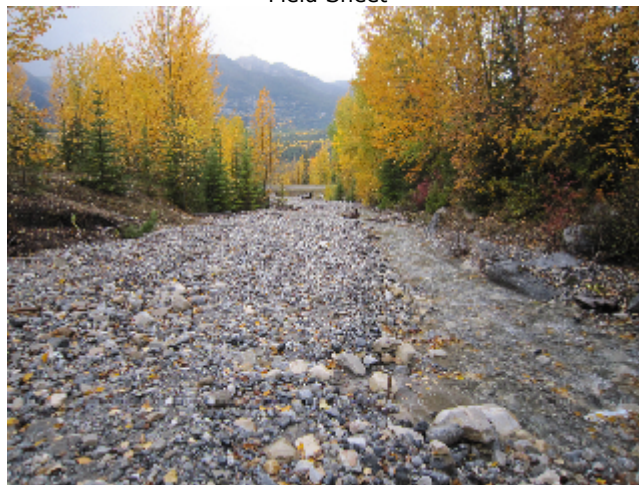
Primary Site Data: CABIN Site Name: _____
 Local Basin Name: _____ Collection: _____
 River/Stream Name: HORSE CREEK Stream Order (app. scale 1st-10th): _____
 Sediment Test Site: Potential Reference Site Confirmed No

Geographical description/notes: _____

Surrounding Land Use (check those present): Forest Field/Pasture Agriculture Residential Railroad/Urban
 Logging Mining Commercial/Industrial Other _____

Domestic surrounding Land Use (check none): Forest Field/Pasture Agriculture Residential Railroad/Urban
 Logging Mining Commercial/Industrial Other _____

Field Sheet



Miscellaneous

Substrate (No image found)
 Up Stream (No image found)

Cabin Assessment Results

Reference Model Summary	
Model	Columbia-Okanagan Preliminary March 2010
Analysis Date	November 01, 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	0.1%	0.1%	6.9%	10.8%	82.1%
CABIN Assessment of NAHOR02 on Sep 28, 2010	Similar to Reference				

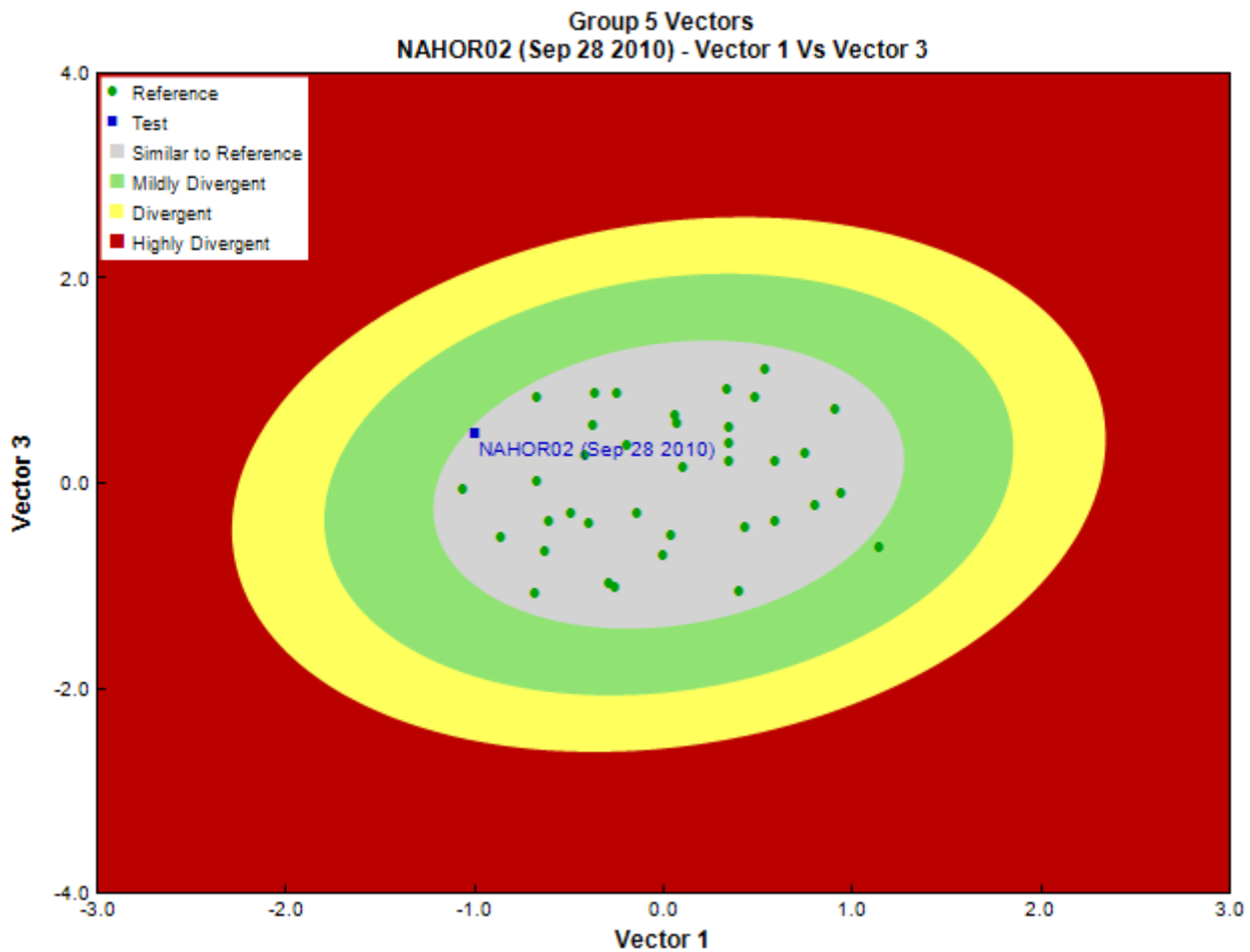


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

Sample Information

Sampling Device	Kick Net
Mesh Size	400
Sampling Time	3
Taxonomist	Gary Lester, Ecoanalysts Inc.
Date Taxonomy Completed	March 09, 2011
	Marchant Box
Sub-Sample Proportion	29/100

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
Annelida	Oligochaeta	Lumbriculida	Lumbriculidae	1	3.4
Arthropoda	Insecta	Diptera	Chironomidae	13	44.8
			Empididae	15	51.7
			Psychodidae	2	6.9
			Simuliidae	2	6.9
			Stratiomyidae	1	3.4
			Tipulidae	3	10.3
		Ephemeroptera	Ameletidae	1	3.4
			Baetidae	11	37.9
			Heptageniidae	25	86.2
		Plecoptera	Capniidae	1	3.4
			Chloroperlidae	14	48.3
			Nemouridae	53	182.8
			Perlodidae	1	3.4
			Taeniopterygidae	169	582.8
		Trichoptera	Hydropsychidae	3	10.3
			Limnephilidae	2	6.9
			Rhyacophilidae	10	34.5
			Total	327	1,127.3

Metrics

Name	NAHOR02	Predicted Group Reference Mean \pm SD
Bray-Curtis Distance	0.35	0.4 \pm 0.1
Biotic Indices		
Hilsenhoff Family index (North-West)	2.6	2.8 \pm 0.3
Intolerant taxa	--	1.0 \pm 0.0
Long-lived taxa	--	1.0 \pm 0.0
Tolerant individuals (%)	--	0.3
Functional Measures		
% Filterers	1.5	1.7 \pm 1.7
% Gatherers	78.6	50.6 \pm 14.6
% Predatores	17.7	15.3 \pm 9.0
% Scrapers	68.2	67.2 \pm 16.8
% Shredder	69.7	38.1 \pm 18.2
No. Clinger Taxa	11.0	19.8 \pm 3.4
Number Of Individuals		
% Chironomidae	4.0	4.6 \pm 5.0
% Coleoptera	0.0	0.0 \pm 0.0
% Diptera + Non-insects	11.3	6.3 \pm 5.3
% Ephemeroptera	11.3	44.9 \pm 17.3
% Ephemeroptera that are Baetidae	29.7	26.1 \pm 20.5
% EPT Individuals	88.7	93.7 \pm 5.3
% Odonata	--	0.0 \pm 0.0
% of 2 dominant taxa	67.9	60.2 \pm 11.4
% of 5 dominant taxa	84.4	84.5 \pm 5.9
% of dominant taxa	51.7	39.3 \pm 12.3
% Plecoptera	72.8	42.9 \pm 17.2
% Tribe Tanyatarisini	--	
% Trichoptera that are Hydropsychida	20.0	27.4 \pm 27.1
% Tricoptera	4.6	5.8 \pm 5.7
No. EPT individuals/Chironomids+EPT Individuals	1.0	1.0 \pm 0.1
Total Abundance	1127.5	2163.6 \pm 1274.4
Richness		
Chironomidae taxa (genus level only)	1.0	0.9 \pm 0.2
Coleoptera taxa	0.0	0.1 \pm 0.2
Diptera taxa	6.0	2.4 \pm 1.0
Ephemeroptera taxa	3.0	3.7 \pm 0.5
EPT Individuals (Sum)	999.9	2023.9 \pm 1195.7
EPT taxa (no)	11.0	12.3 \pm 1.9
Odonata taxa	--	0.0 \pm 0.0
Pielou's Evenness	0.6	0.7 \pm 0.1

Metrics

Name	NAHOR02	Predicted Group Reference Mean \pm SD
Plecoptera taxa	5.0	5.5 \pm 1.1
Shannon-Wiener Diversity	1.7	1.9 \pm 0.3
Simpson's Diversity	0.7	0.8 \pm 0.1
Simpson's Evenness	0.2	0.3 \pm 0.1
Total No. of Taxa	18.0	16.0 \pm 3.0
Trichoptera taxa	3.0	3.2 \pm 1.0

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NAHOR02
	Group 1	Group 2	Group 3	Group 4	Group 5	
Baetidae	100%	100%	100%	100%	97%	0.98
Chironomidae	100%	100%	100%	100%	95%	0.96
Chloroperlidae	78%	88%	94%	100%	100%	1.00
Ephemeroellidae	78%	100%	100%	100%	100%	1.00
Heptageniidae	100%	100%	100%	100%	100%	1.00
Hydropsychidae	11%	92%	78%	92%	86%	0.86
Nemouridae	100%	100%	100%	100%	100%	1.00
Perlodidae	78%	78%	89%	92%	81%	0.83
Rhyacophilidae	100%	92%	100%	100%	95%	0.96
Taeniopterygidae	89%	49%	100%	92%	97%	0.97

RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	12.60
RIVPACS : Observed taxa P>0.50	12.00
RIVPACS : O:E (p > 0.5)	0.95
RIVPACS : Expected taxa P>0.70	9.54
RIVPACS : Observed taxa P>0.70	9.00
RIVPACS : O:E (p > 0.7)	0.94

Habitat Description

Variable	NAHOR02	Predicted Group Reference Mean \pm SD
Bedrock Geology		
Alluvium (%)	0.00000	0.00000 \pm 0.00000
Intrusive (%)	0.00000	0.46153 \pm 2.09955
Metamorphic (%)	0.00000	0.17691 \pm 0.85012
Sedimentary (%)	100.00000	99.36155 \pm 2.22799
Ultramafic (%)	0.00000	0.00000 \pm 0.00000
Volcanic (%)	0.00000	0.00000 \pm 0.00000
Channel		
Depth-Avg (cm)	13.3	21.5 \pm 9.7
Depth-BankfullMinusWetted (cm)	46.00	38.14 \pm 36.11
Depth-Max (cm)	21.5	31.0 \pm 16.5
Macrophyte (PercentRange)	0	0 \pm 0
Reach-%CanopyCoverage (PercentRange)	1.00	1.54 \pm 1.28
Reach-DomStreamsideVeg (Category (1-4))	3	3 \pm 1
Reach-Pools (Binary)	1	1 \pm 0
Reach-Rapids (Binary)	0	0 \pm 0
Reach-Riffles (Binary)	1	1 \pm 0
Reach-StraightRun (Binary)	1	0 \pm 1
Slope (m/m)	0.0380000	0.0581357 \pm 0.0554952
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)	0.28	0.51 \pm 0.27
Velocity-Max (m/s)	0.54	0.78 \pm 0.40
Width-Bankfull (m)	14.5	13.7 \pm 16.4
Width-Wetted (m)	3.2	9.0 \pm 13.1

Habitat Description

Variable	NAHOR02	Predicted Group Reference Mean \pm SD
XSEC-VelMethod (Category (1-3))	1	2 \pm 1
Climate		
Precip01_JAN (mm)	83.00000	130.45668 \pm 67.17180
Precip02_FEB (mm)	54.00000	102.48242 \pm 52.12836
Precip03_MAR (mm)	40.00000	89.80929 \pm 42.79174
Precip04_APR (mm)	83.00000	135.11134 \pm 66.06707
Precip05_MAY (mm)	46.00000	70.51109 \pm 13.79432
Precip06_JUN (mm)	60.00000	86.65922 \pm 19.93623
Precip07_JUL (mm)	61.00000	79.11475 \pm 19.88523
Precip08_AUG (mm)	58.00000	76.86606 \pm 21.34619
Precip09_SEP (mm)	51.00000	71.16784 \pm 23.11306
Precip10_OCT (mm)	56.00000	88.14083 \pm 44.84739
Precip11_NOV (mm)	78.00000	134.64587 \pm 63.61897
Precip12_DEC (mm)	87.00000	142.32359 \pm 65.85239
PrecipTotal_ANNUAL (mm)	714.00000	1143.02476 \pm 453.62461
Temp01_JANMax (Degrees Celsius)	-6.00000	-6.18206 \pm 1.69263
Temp01_JANmin (Degrees Celsius)	-13.00000	-13.62029 \pm 2.05208
Temp02_FEBmax (Degrees Celsius)	-1.00000	-2.89816 \pm 1.88421
Temp02_FEBmin (Degrees Celsius)	-10.00000	-11.14625 \pm 1.99282
Temp03_MARmax (Degrees Celsius)	4.00000	0.98920 \pm 2.35950
Temp03_MARmin (Degrees Celsius)	-6.00000	-7.98295 \pm 1.94687
Temp04_APRmax (Degrees Celsius)	10.00000	5.37616 \pm 3.02243
Temp04_APRmin (Degrees Celsius)	-2.00000	-3.74673 \pm 1.66191
Temp05_MAYmax (Degrees Celsius)	15.00000	10.12548 \pm 3.18022
Temp05_MAYmin (Degrees Celsius)	1.00000	0.09616 \pm 1.15628
Temp06_JUNMax (Degrees Celsius)	19.00000	13.85415 \pm 3.23839
Temp06_JUNMin (Degrees Celsius)	5.00000	2.79527 \pm 1.60213
Temp07_JULmax (Degrees Celsius)	22.00000	17.45582 \pm 3.27590
Temp07_JULmin (Degrees Celsius)	7.00000	4.99257 \pm 1.52992
Temp08_AUGmax (Degrees Celsius)	22.00000	17.36896 \pm 3.11866
Temp08_AUGmin (Degrees Celsius)	6.00000	4.84827 \pm 1.46649
Temp09_SEPmax (Degrees Celsius)	16.00000	12.13974 \pm 2.86510
Temp09_SEPmin (Degrees Celsius)	2.00000	1.12535 \pm 1.20660
Temp10_OCTmax (Degrees Celsius)	8.00000	5.04078 \pm 2.46521
Temp10_OCTmin (Degrees Celsius)	-1.00000	-2.41023 \pm 1.18961
Temp11_NOVmax (Degrees Celsius)	0.00000	-2.24818 \pm 1.93047
Temp11_NOVmin (Degrees Celsius)	-7.00000	-8.35137 \pm 1.96467
Temp12_DECmax (Degrees Celsius)	-6.00000	-6.49458 \pm 1.76429
Temp12_DECmin (Degrees Celsius)	-12.00000	-12.72330 \pm 1.87798
TempANNUALmax (Degrees Celsius)	8.00000	5.16639 \pm 2.57569
TempANNUALmean (Degrees Celsius)	3.00000	0.71683 \pm 1.81248
TempANNUALmin (Degrees Celsius)	-2.00000	-3.38604 \pm 1.60598
Hydrology		
Drainage-Area (km ²)	23.84194	135.66658 \pm 373.96803
Perimeter (Km)	34.59989	55.78285 \pm 83.00734
StreamDensity (m/km ²)	2757.66254	2198.74079 \pm 886.68339
StreamLength (m)	65748.03	293250.33 \pm 851854.38
Landcover		
Natl-AnnCrops (%)	0.00000	0.00000 \pm 0.00000
Natl-Barren (%)	0.00000	0.00000 \pm 0.00000
Natl-BroadleafDense (%)	0.00000	0.00523 \pm 0.02638
Natl-BroadleafOpen (%)	1.66113	1.35705 \pm 2.04550
Natl-BroadleafSparse (%)	0.00000	0.31953 \pm 0.53788
Natl-Coniferous (%)	0.00000	0.00000 \pm 0.00000
Natl-ConiferousDense (%)	2.08345	4.95677 \pm 7.46543
Natl-ConiferousOpen (%)	45.69524	34.34335 \pm 18.65764
Natl-ConiferousSparse (%)	5.63003	1.39163 \pm 1.60111
Natl-Deciduous (%)	0.00000	0.00000 \pm 0.00000
Natl-Developed (%)	0.00000	0.00002 \pm 0.00009
Natl-ExposedLand (%)	10.98581	16.95282 \pm 9.64125
Natl-Grassland (%)	8.24811	5.60615 \pm 5.17505
Natl-Herb (%)	0.24413	2.04978 \pm 2.79736

Habitat Description

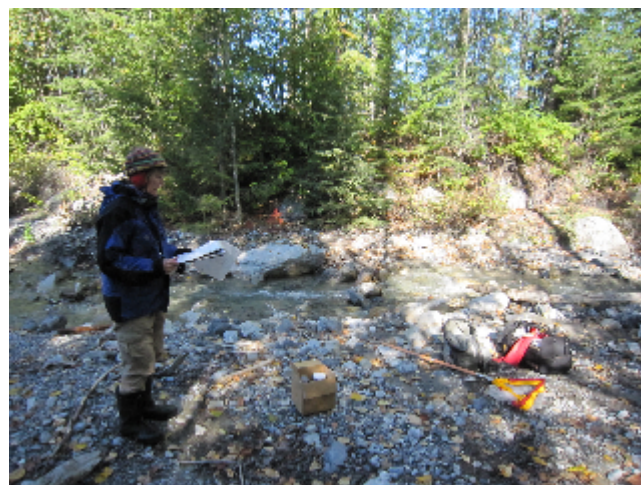
Variable	NAHOR02	Predicted Group Reference Mean \pm SD
Natl-MixedForest (%)	0.00000	0.00000 \pm 0.00000
Natl-MixedwoodDense (%)	0.15478	0.02636 \pm 0.08976
Natl-MixedwoodOpen (%)	9.58942	2.10440 \pm 2.63686
Natl-MixedwoodSparse (%)	0.00000	0.01817 \pm 0.04448
Natl-PerennCropsPast (%)	0.00000	0.00000 \pm 0.00000
Natl-Rock/Rubble (%)	3.31291	6.97447 \pm 7.52078
Natl-Shrubland (%)	0.00000	0.00000 \pm 0.00000
Natl-ShrubLow (%)	6.49920	4.49178 \pm 5.44294
Natl-ShrubTall (%)	0.00000	0.33533 \pm 1.14136
Natl-SnowIce (%)	0.00000	7.70046 \pm 9.06096
Natl-Water (%)	0.00000	0.14384 \pm 0.45543
Natl-Wetland (%)	0.00000	0.00000 \pm 0.00000
Natl-WetlandHerb (%)	0.00000	0.00639 \pm 0.02401
Natl-WetlandShrub (%)	0.00000	0.00868 \pm 0.02574
Natl-WetlandTreed (%)	0.00000	0.00226 \pm 0.00959
Reg-Ice (%)	0.00000	3.06094 \pm 5.65390
Substrate Data		
%Bedrock (%)	0	1 \pm 1
%Boulder (%)	0	3 \pm 3
%Cobble (%)	39	64 \pm 17
%Gravel (%)	6	2 \pm 2
%Pebble (%)	55	31 \pm 16
%Sand (%)	0	0 \pm 0
%Silt+Clay (%)	0	0 \pm 0
D50 (cm)	5.00	19.61 \pm 30.65
Dg (cm)	4.9	20.3 \pm 30.8
Dominant-1st (Category(0-9))	6	7 \pm 1
Dominant-2nd (Category(0-9))	5	6 \pm 1
Embeddedness (Category(1-5))	4	4 \pm 1
PeriphytonCoverage (Category(1-5))	1	2 \pm 1
Topography		
ElevationMax (m)	2586.00000	2829.64865 \pm 315.67549
ElevationMin (m)	811.00000	1172.81081 \pm 249.32284
ElevationStdev (m)	365.04788	342.56455 \pm 77.02221
Reg-SlopeLT30% (%)	8.99700	16.26604 \pm 8.50298
Slope30-50% (%)	27.62815	28.13773 \pm 4.86732
Slope50-60% (%)	16.16695	14.11202 \pm 1.82185
SlopeAvg (%)	55.87465	56.75540 \pm 7.27461
SlopeGT60% (%)	41.06465	39.57775 \pm 9.82818
SlopeLT30% (%)	15.14024	18.17250 \pm 6.88627
SlopeMax (%)	229.09795	317.81636 \pm 141.61151
SlopeMin (%)	0.59331	0.79557 \pm 1.30240
SlopeStdev (%)	24.97949	29.56849 \pm 5.64880
Water Chemistry		
General-DO (mg/L)	10.0000000	11.0635135 \pm 0.9899052
General-pH (pH)	8.5	7.7 \pm 0.7
General-SpCond (μ S/cm)	366.8000000	160.3567568 \pm 118.4083015
General-TempAir (Degrees Celsius)	9.7	10.5 \pm 0.7
General-TempWater (Degrees Celsius)	8.7000000	5.5262162 \pm 1.8860693
General-Turbidity (NTU)	1.0200000	0.1015000 \pm 0.0459619

Site Description

Study Name	CBWQ-Upper Columbia
Site	NAHOR02
Sampling Date	Sep 20 2011
Know Your Watershed Basin	Upper Columbia
Province / Territory	British Columbia
Terrestrial Ecological Classification	Montane Cordillera EcoZone Southern Rocky Mountain Trench EcoRegion
Coordinates (decimal degrees)	51.21306 N, 116.89194 W
Altitude	806
Local Basin Name	Horse Cr
	Columbia
Stream Order	4



Figure 1. Location Map



Across Reach
Aerial (No image found)



Down Stream
Field Sheet (No image found)



Miscellaneous
Substrate (No image found)



Up Stream

Cabin Assessment Results

Reference Model Summary	
Model	Columbia-Okanagan Preliminary March 2010
Analysis Date	November 01, 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	0.1%	0.1%	6.9%	10.4%	82.6%
CABIN Assessment of NAHOR02 on Sep 20, 2011	Mildly Divergent				

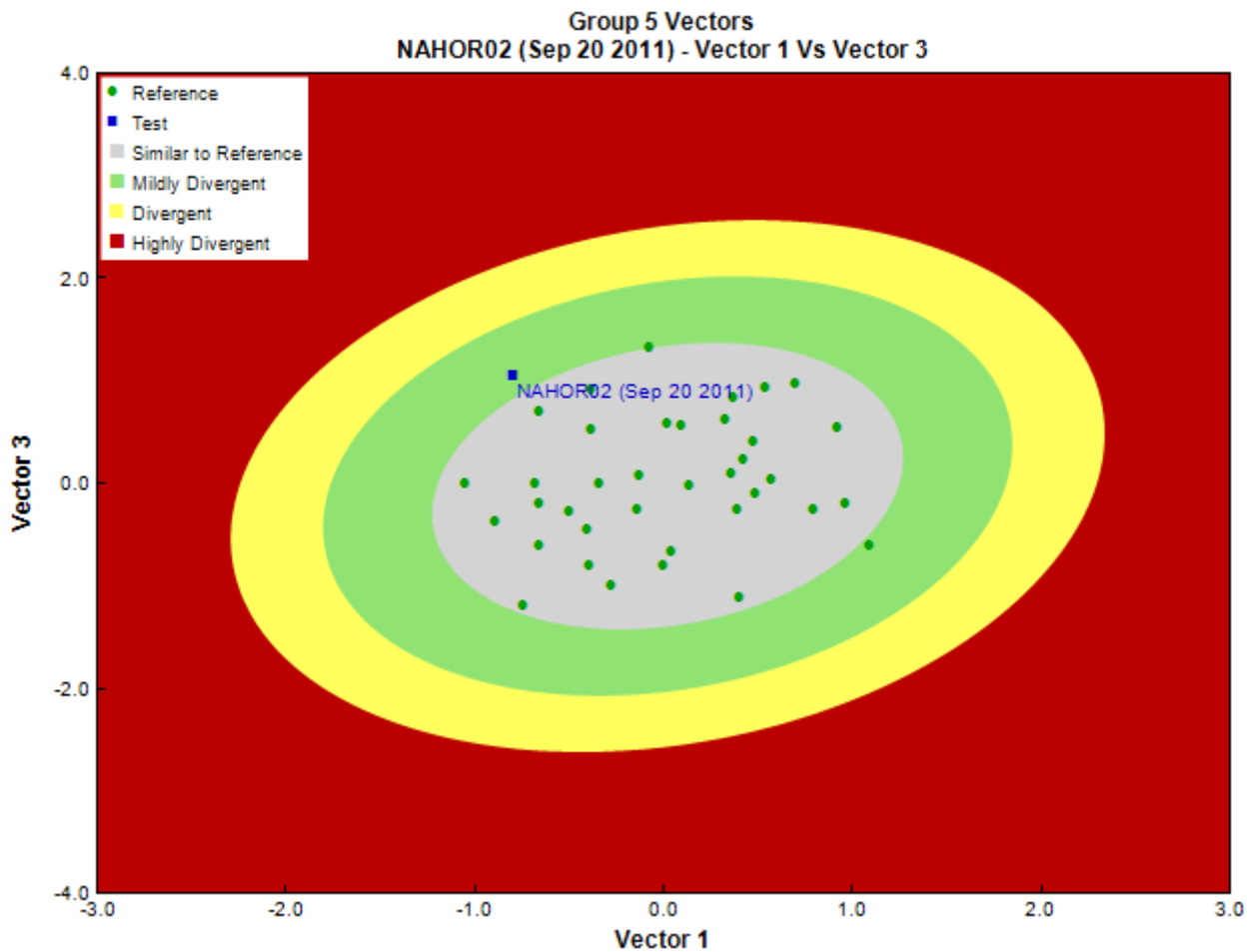


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

Sample Information

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

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
Annelida	Oligochaeta	Enchytraeida	Enchytraeidae	2	2.0
Arthropoda	Insecta	Diptera	Chironomidae	7	7.0
			Empididae	1	1.0
			Simuliidae	1	1.0
			Tipulidae	1	1.0
		Ephemeroptera	Ameletidae	1	1.0
			Ephemerellidae	1	1.0
			Heptageniidae	78	78.0
		Plecoptera	Capniidae	1	1.0
			Chloroperlidae	25	25.0
			Leuctridae	2	2.0
			Nemouridae	31	31.0
			Perlodidae	2	2.0
			Taeniopterygidae	300	300.0
		Trichoptera	Rhyacophilidae	2	2.0
Mollusca	Gastropoda	Basommatophora	Planorbidae	1	1.0
			Total	456	456.0

Metrics

Name	NAHOR02	Predicted Group Reference Mean \pm SD
Bray-Curtis Distance	0.49	0.4 \pm 0.1
Biotic Indices		
Hilsenhoff Family index (North-West)	2.4	2.8 \pm 0.3
Intolerant taxa	--	1.0 \pm 0.0
Long-lived taxa	--	1.0 \pm 0.0
Tolerant individuals (%)	0.2	0.3
Functional Measures		
% Filterers	0.2	1.7 \pm 1.7
% Gatherers	80.7	50.6 \pm 14.6
% Predatores	8.3	15.3 \pm 9.0
% Scrapers	88.8	67.2 \pm 16.8
% Shredder	73.5	38.1 \pm 18.2
No. Clinger Taxa	10.0	19.8 \pm 3.4
Number Of Individuals		
% Chironomidae	1.5	4.6 \pm 5.0
% Coleoptera	0.0	0.0 \pm 0.0
% Diptera + Non-insects	2.9	6.3 \pm 5.3
% Ephemeroptera	17.5	44.9 \pm 17.3
% Ephemeroptera that are Baetidae	0.0	26.1 \pm 20.5
% EPT Individuals	97.1	93.7 \pm 5.3
% Odonata	--	0.0 \pm 0.0
% of 2 dominant taxa	82.9	60.2 \pm 11.4
% of 5 dominant taxa	96.7	84.5 \pm 5.9
% of dominant taxa	65.8	39.3 \pm 12.3
% Plecoptera	79.2	42.9 \pm 17.2
% Tribe Tanyatarisini	--	
% Trichoptera that are Hydropsychida	0.0	27.4 \pm 27.1
% Tricoptera	0.4	5.8 \pm 5.7
No. EPT individuals/Chironomids+EPT Individuals	1.0	1.0 \pm 0.1
Total Abundance	456.0	2163.6 \pm 1274.4
Richness		
Chironomidae taxa (genus level only)	1.0	0.9 \pm 0.2
Coleoptera taxa	0.0	0.1 \pm 0.2
Diptera taxa	4.0	2.4 \pm 1.0
Ephemeroptera taxa	3.0	3.7 \pm 0.5
EPT Individuals (Sum)	443.0	2023.9 \pm 1195.7
EPT taxa (no)	10.0	12.3 \pm 1.9
Odonata taxa	--	0.0 \pm 0.0
Pielou's Evenness	0.4	0.7 \pm 0.1
Plecoptera taxa	6.0	5.5 \pm 1.1
Shannon-Wiener Diversity	1.2	1.9 \pm 0.3

Metrics

Name	NAHOR02	Predicted Group Reference Mean \pm SD
Simpson's Diversity	0.5	0.8 \pm 0.1
Simpson's Evenness	0.1	0.3 \pm 0.1
Total No. of Taxa	16.0	16.0 \pm 3.0
Trichoptera taxa	1.0	3.2 \pm 1.0

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NAHOR02
	Group 1	Group 2	Group 3	Group 4	Group 5	
Baetidae	100%	100%	100%	100%	97%	0.98
Chironomidae	100%	100%	100%	100%	95%	0.96
Chloroperlidae	78%	88%	94%	100%	100%	1.00
Ephemereididae	78%	100%	100%	100%	100%	1.00
Heptageniidae	100%	100%	100%	100%	100%	1.00
Hydropsychidae	11%	92%	78%	92%	86%	0.86
Nemouridae	100%	100%	100%	100%	100%	1.00
Perlodidae	78%	78%	89%	92%	81%	0.83
Rhyacophilidae	100%	92%	100%	100%	95%	0.96
Taeniopterygidae	89%	49%	100%	92%	97%	0.97

RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	12.60
RIVPACS : Observed taxa P>0.50	12.00
RIVPACS : O:E (p > 0.5)	0.95
RIVPACS : Expected taxa P>0.70	9.54
RIVPACS : Observed taxa P>0.70	8.00
RIVPACS : O:E (p > 0.7)	0.84

Habitat Description

Variable	NAHOR02	Predicted Group Reference Mean \pm SD
Bedrock Geology		
Alluvium (%)	0.00000	0.00000 \pm 0.00000
Intrusive (%)	0.00000	0.46153 \pm 2.09955
Metamorphic (%)	0.00000	0.17691 \pm 0.85012
Sedimentary (%)	100.00000	99.36155 \pm 2.22799
Ultramafic (%)	0.00000	0.00000 \pm 0.00000
Volcanic (%)	0.00000	0.00000 \pm 0.00000
Channel		
Depth-Avg (cm)	9.2	21.5 \pm 9.7
Depth-BankfullMinusWetted (cm)	52.00	38.14 \pm 36.11
Depth-Max (cm)	13.5	31.0 \pm 16.5
Macrophyte (PercentRange)	0	0 \pm 0
Reach-%CanopyCoverage (PercentRange)	2.00	1.54 \pm 1.28
Reach-DomStreamsideVeg (Category (1-4))	3	3 \pm 1
Reach-Pools (Binary)	0	1 \pm 0
Reach-Rapids (Binary)	0	0 \pm 0
Reach-Riffles (Binary)	1	1 \pm 0
Reach-StraightRun (Binary)	1	0 \pm 1
Slope (m/m)	0.0380000	0.0581357 \pm 0.0554952
Veg-Coniferous (Binary)	1	1 \pm 0
Veg-Deciduous (Binary)	1	1 \pm 0
Veg-GrassesFerns (Binary)	0	1 \pm 0
Veg-Shrubs (Binary)	1	1 \pm 0
Velocity-Avg (m/s)	0.48	0.51 \pm 0.27
Velocity-Max (m/s)	0.70	0.78 \pm 0.40
Width-Bankfull (m)	13.9	13.7 \pm 16.4
Width-Wetted (m)	3.4	9.0 \pm 13.1
XSEC-VelMethod (Category (1-3))	1	2 \pm 1
Climate		

Habitat Description

Variable	NAHOR02	Predicted Group Reference Mean \pm SD
Precip01_JAN (mm)	83.00000	130.45668 \pm 67.17180
Precip02_FEB (mm)	54.00000	102.48242 \pm 52.12836
Precip03_MAR (mm)	40.00000	89.80929 \pm 42.79174
Precip04_APR (mm)	83.00000	135.11134 \pm 66.06707
Precip05_MAY (mm)	46.00000	70.51109 \pm 13.79432
Precip06_JUN (mm)	60.00000	86.65922 \pm 19.93623
Precip07_JUL (mm)	61.00000	79.11475 \pm 19.88523
Precip08_AUG (mm)	58.00000	76.86606 \pm 21.34619
Precip09_SEP (mm)	51.00000	71.16784 \pm 23.11306
Precip10_OCT (mm)	56.00000	88.14083 \pm 44.84739
Precip11_NOV (mm)	78.00000	134.64587 \pm 63.61897
Precip12_DEC (mm)	87.00000	142.32359 \pm 65.85239
PrecipTotal_ANNUAL (mm)	714.00000	1143.02476 \pm 453.62461
Temp01_JANMax (Degrees Celsius)	-6.00000	-6.18206 \pm 1.69263
Temp01_JANmin (Degrees Celsius)	-13.00000	-13.62029 \pm 2.05208
Temp02_FEBmax (Degrees Celsius)	-1.00000	-2.89816 \pm 1.88421
Temp02_FEBmin (Degrees Celsius)	-10.00000	-11.14625 \pm 1.99282
Temp03_MARmax (Degrees Celsius)	4.00000	0.98920 \pm 2.35950
Temp03_MARmin (Degrees Celsius)	-6.00000	-7.98295 \pm 1.94687
Temp04_APRmax (Degrees Celsius)	10.00000	5.37616 \pm 3.02243
Temp04_APRmin (Degrees Celsius)	-2.00000	-3.74673 \pm 1.66191
Temp05_MAYmax (Degrees Celsius)	15.00000	10.12548 \pm 3.18022
Temp05_MAYmin (Degrees Celsius)	1.00000	0.09616 \pm 1.15628
Temp06_JUNMax (Degrees Celsius)	19.00000	13.85415 \pm 3.23839
Temp06_JUNMin (Degrees Celsius)	5.00000	2.79527 \pm 1.60213
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Temp07_JULmin (Degrees Celsius)	7.00000	4.99257 \pm 1.52992
Temp08_AUGmax (Degrees Celsius)	22.00000	17.36896 \pm 3.11866
Temp08_AUGmin (Degrees Celsius)	6.00000	4.84827 \pm 1.46649
Temp09_SEPmax (Degrees Celsius)	16.00000	12.13974 \pm 2.86510
Temp09_SEPmin (Degrees Celsius)	2.00000	1.12535 \pm 1.20660
Temp10_OCTmax (Degrees Celsius)	8.00000	5.04078 \pm 2.46521
Temp10_OCTmin (Degrees Celsius)	-1.00000	-2.41023 \pm 1.18961
Temp11_NOVmax (Degrees Celsius)	0.00000	-2.24818 \pm 1.93047
Temp11_NOVmin (Degrees Celsius)	-7.00000	-8.35137 \pm 1.96467
Temp12_DECmax (Degrees Celsius)	-6.00000	-6.49458 \pm 1.76429
Temp12_DECmin (Degrees Celsius)	-12.00000	-12.72330 \pm 1.87798
TempANNUALmax (Degrees Celsius)	8.00000	5.16639 \pm 2.57569
TempANNUALmean (Degrees Celsius)	3.00000	0.71683 \pm 1.81248
TempANNUALmin (Degrees Celsius)	-2.00000	-3.38604 \pm 1.60598
Hydrology		
Drainage-Area (km ²)	23.84194	135.66658 \pm 373.96803
Perimeter (Km)	34.59989	55.78285 \pm 83.00734
StreamDensity (m/km ²)	2757.66254	2198.74079 \pm 886.68339
StreamLength (m)	65748.03	293250.33 \pm 851854.38
Landcover		
Natl-AnnCrops (%)	0.00000	0.00000 \pm 0.00000
Natl-Barren (%)	0.00000	0.00000 \pm 0.00000
Natl-BroadleafDense (%)	0.00000	0.00523 \pm 0.02638
Natl-BroadleafOpen (%)	1.66113	1.35705 \pm 2.04550
Natl-BroadleafSparse (%)	0.00000	0.31953 \pm 0.53788
Natl-Coniferous (%)	0.00000	0.00000 \pm 0.00000
Natl-ConiferousDense (%)	2.08345	4.95677 \pm 7.46543
Natl-ConiferousOpen (%)	45.69524	34.34335 \pm 18.65764
Natl-ConiferousSparse (%)	5.63003	1.39163 \pm 1.60111
Natl-Deciduous (%)	0.00000	0.00000 \pm 0.00000
Natl-Developed (%)	0.00000	0.00002 \pm 0.00009
Natl-ExposedLand (%)	10.98581	16.95282 \pm 9.64125
Natl-Grassland (%)	8.24811	5.60615 \pm 5.17505
Natl-Herb (%)	0.24413	2.04978 \pm 2.79736
Natl-MixedForest (%)	0.00000	0.00000 \pm 0.00000
Natl-MixedwoodDense (%)	0.15478	0.02636 \pm 0.08976

Habitat Description

Variable	NAHOR02	Predicted Group Reference Mean \pm SD
Natl-MixedwoodOpen (%)	9.58942	2.10440 \pm 2.63686
Natl-MixedwoodSparse (%)	0.00000	0.01817 \pm 0.04448
Natl-PerennCropsPast (%)	0.00000	0.00000 \pm 0.00000
Natl-Rock/Rubble (%)	3.31291	6.97447 \pm 7.52078
Natl-Shrubland (%)	0.00000	0.00000 \pm 0.00000
Natl-ShrubLow (%)	6.49920	4.49178 \pm 5.44294
Natl-ShrubTall (%)	0.00000	0.33533 \pm 1.14136
Natl-SnowIce (%)	0.00000	7.70046 \pm 9.06096
Natl-Water (%)	0.00000	0.14384 \pm 0.45543
Natl-Wetland (%)	0.00000	0.00000 \pm 0.00000
Natl-WetlandHerb (%)	0.00000	0.00639 \pm 0.02401
Natl-WetlandShrub (%)	0.00000	0.00868 \pm 0.02574
Natl-WetlandTreed (%)	0.00000	0.00226 \pm 0.00959
Reg-Ice (%)	0.00000	3.06094 \pm 5.65390
Substrate Data		
%Bedrock (%)	0	1 \pm 1
%Boulder (%)	4	3 \pm 3
%Cobble (%)	49	64 \pm 17
%Gravel (%)	5	2 \pm 2
%Pebble (%)	42	31 \pm 16
%Sand (%)	0	0 \pm 0
%Silt+Clay (%)	0	0 \pm 0
D50 (cm)	7.00	19.61 \pm 30.65
Dg (cm)	6.8	20.3 \pm 30.8
Dominant-1st (Category(0-9))	5	7 \pm 1
Dominant-2nd (Category(0-9))	6	6 \pm 1
Embeddedness (Category(1-5))	4	4 \pm 1
PeriphytonCoverage (Category(1-5))	1	2 \pm 1
SurroundingMaterial (Category(0-9))	3	3 \pm 1
Topography		
ElevationMax (m)	2586.00000	2829.64865 \pm 315.67549
ElevationMin (m)	811.00000	1172.81081 \pm 249.32284
ElevationStdev (m)	365.04788	342.56455 \pm 77.02221
Reg-SlopeLT30% (%)	9.00000	16.26604 \pm 8.50298
Slope30-50% (%)	27.62815	28.13773 \pm 4.86732
Slope50-60% (%)	16.16695	14.11202 \pm 1.82185
SlopeAvg (%)	55.87465	56.75540 \pm 7.27461
SlopeGT60% (%)	41.06465	39.57775 \pm 9.82818
SlopeLT30% (%)	15.14024	18.17250 \pm 6.88627
SlopeMax (%)	229.09795	317.81636 \pm 141.61151
SlopeMin (%)	0.59331	0.79557 \pm 1.30240
SlopeStdev (%)	24.97949	29.56849 \pm 5.64880
Water Chemistry		
General-Alkalinity (mg/L)	160.000000	68.5944444 \pm 52.1098452
General-DO (mg/L)	8.000000	11.0635135 \pm 0.9899052
General-pH (pH)	8.7	7.7 \pm 0.7
General-SpCond (μ S/cm)	367.300000	160.3567568 \pm 118.4083015
General-TempAir (Degrees Celsius)	5.9	10.5 \pm 0.7
General-TempWater (Degrees Celsius)	7.100000	5.5262162 \pm 1.8860693
General-Turbidity (NTU)	3.320000	0.1015000 \pm 0.0459619
Nitrogen-NO2 (mg/L)	0.002500	0.0074306 \pm 0.0217095
Nitrogen-NO2+NO3 (mg/L)	0.030000	0.0315000 \pm 0.0316491
Nitrogen-NO3 (mg/L)	0.030000	0.0699722 \pm 0.0547511

Site Description

Study Name	CBWQ-Upper Columbia
Site	NAHOR02
Sampling Date	Sep 18 2012
Know Your Watershed Basin	Upper Columbia
Province / Territory	British Columbia
Terrestrial Ecological Classification	Montane Cordillera EcoZone Southern Rocky Mountain Trench EcoRegion
Coordinates (decimal degrees)	51.21300 N, 116.89211 W
Altitude	2674
Local Basin Name	Horse Cr
	Columbia
Stream Order	4



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	November 01, 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	0.0%	0.1%	6.8%	10.1%	82.9%	
CABIN Assessment of NAHOR02 on Sep 18, 2012	Mildly Divergent					

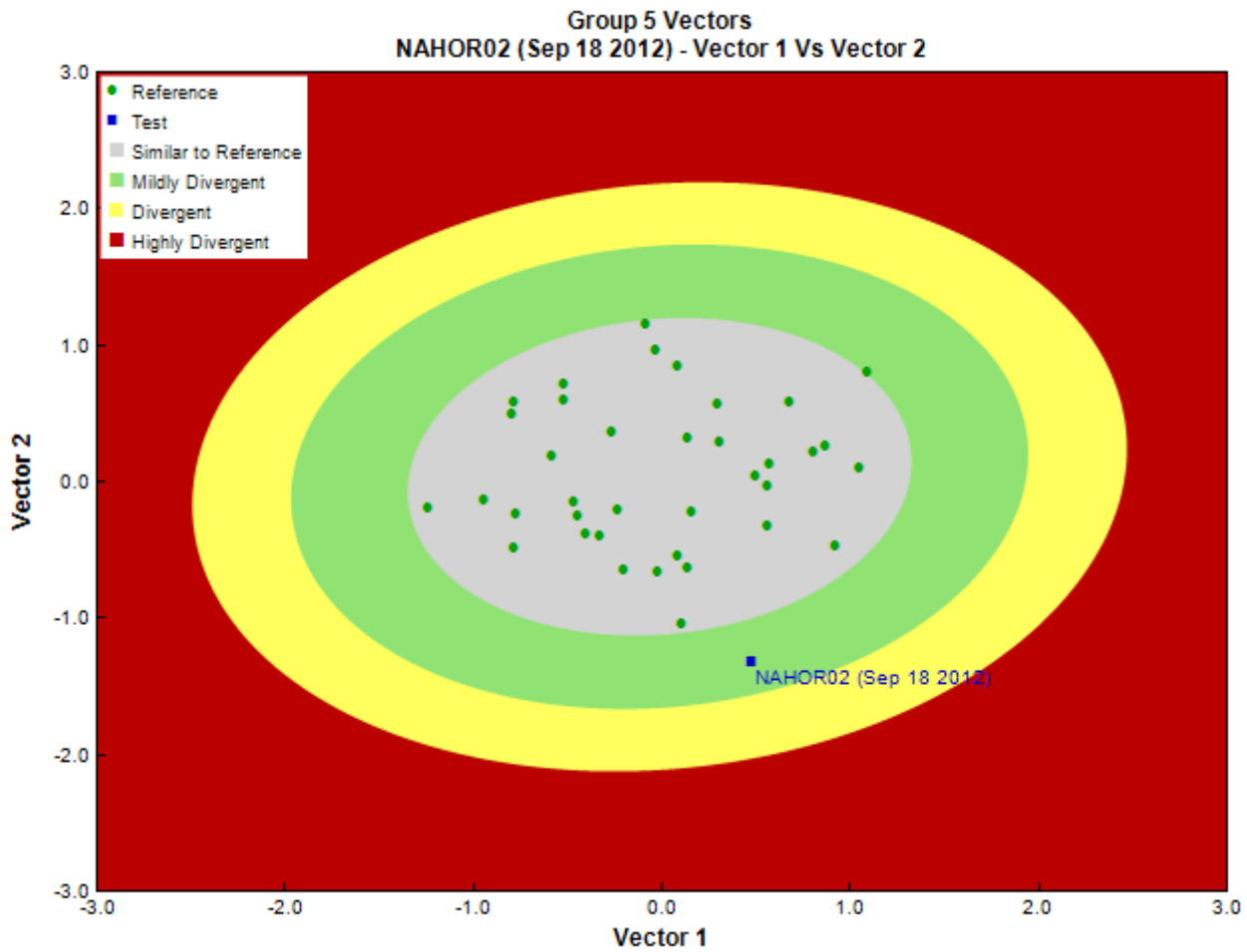


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

Sample Information

Sampling Device	Kick Net
Mesh Size	400
Sampling Time	3
Taxonomist	Eco Analysts, EcoAnalysts
Date Taxonomy Completed	February 12, 2013
	Marchant Box
Sub-Sample Proportion	49/100

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count	
Arthropoda	Insecta	Diptera	Chironomidae	20	40.8	
			Empididae	1	2.0	
			Simuliidae	1	2.0	
		Ephemeroptera	Baetidae	7	14.3	
			Heptageniidae	10	20.4	
			Plecoptera	Capniidae	11	22.4
				Chloroperlidae	9	18.4
		Trichoptera	Leuctridae	1	2.0	
			Nemouridae	28	57.1	
			Taeniopterygidae	236	481.6	
			Glossosomatidae	1	2.0	
			Total	325	663.0	

Metrics

Name	NAHOR02	Predicted Group Reference Mean \pm SD
Bray-Curtis Distance	0.41	0.4 \pm 0.1
Biotic Indices		
Hilsenhoff Family index (North-West)	2.3	2.8 \pm 0.3
Intolerant taxa	--	1.0 \pm 0.0
Long-lived taxa	--	1.0 \pm 0.0
Tolerant individuals (%)	--	0.3
Functional Measures		
% Filterers	0.3	1.7 \pm 1.7
% Gatherers	90.2	50.6 \pm 14.6
% Predatores	9.5	15.3 \pm 9.0
% Scrapers	81.2	67.2 \pm 16.8
% Shredder	84.9	38.1 \pm 18.2
No. Clinger Taxa	9.0	19.8 \pm 3.4
Number Of Individuals		
% Chironomidae	6.2	4.6 \pm 5.0
% Coleoptera	0.0	0.0 \pm 0.0
% Diptera + Non-insects	6.8	6.3 \pm 5.3
% Ephemeroptera	5.2	44.9 \pm 17.3
% Ephemeroptera that are Baetidae	41.2	26.1 \pm 20.5
% EPT Individuals	93.2	93.7 \pm 5.3
% Odonata	--	0.0 \pm 0.0
% of 2 dominant taxa	81.2	60.2 \pm 11.4
% of 5 dominant taxa	93.8	84.5 \pm 5.9
% of dominant taxa	72.6	39.3 \pm 12.3
% Plecoptera	87.7	42.9 \pm 17.2
% Tribe Tanyatarisini	--	
% Trichoptera that are Hydropsychida	0.0	27.4 \pm 27.1
% Tricoptera	0.3	5.8 \pm 5.7
No. EPT individuals/Chironomids+EPT Individuals	0.9	1.0 \pm 0.1
Total Abundance	663.2	2163.6 \pm 1274.4
Richness		
Chironomidae taxa (genus level only)	1.0	0.9 \pm 0.2
Coleoptera taxa	0.0	0.1 \pm 0.2
Diptera taxa	3.0	2.4 \pm 1.0
Ephemeroptera taxa	2.0	3.7 \pm 0.5
EPT Individuals (Sum)	618.3	2023.9 \pm 1195.7
EPT taxa (no)	8.0	12.3 \pm 1.9
Odonata taxa	--	0.0 \pm 0.0
Pielou's Evenness	0.5	0.7 \pm 0.1
Plecoptera taxa	5.0	5.5 \pm 1.1
Shannon-Wiener Diversity	1.1	1.9 \pm 0.3
Simpson's Diversity	0.5	0.8 \pm 0.1
Simpson's Evenness	0.2	0.3 \pm 0.1
Total No. of Taxa	11.0	16.0 \pm 3.0
Trichoptera taxa	1.0	3.2 \pm 1.0

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NAHOR02
	Group 1	Group 2	Group 3	Group 4	Group 5	
Baetidae	100%	100%	100%	100%	97%	0.98
Chironomidae	100%	100%	100%	100%	95%	0.96
Chloroperlidae	78%	88%	94%	100%	100%	1.00
Ephemereillidae	78%	100%	100%	100%	100%	1.00
Heptageniidae	100%	100%	100%	100%	100%	1.00
Hydropsychidae	11%	92%	78%	92%	86%	0.86
Nemouridae	100%	100%	100%	100%	100%	1.00
Perlodidae	78%	78%	89%	92%	81%	0.83
Rhyacophilidae	100%	92%	100%	100%	95%	0.96
Taeniopterygidae	89%	49%	100%	92%	97%	0.97

RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	12.60
RIVPACS : Observed taxa P>0.50	9.00
RIVPACS : O:E (p > 0.5)	0.71
RIVPACS : Expected taxa P>0.70	9.54
RIVPACS : Observed taxa P>0.70	6.00
RIVPACS : O:E (p > 0.7)	0.63

Habitat Description

Variable	NAHOR02	Predicted Group Reference Mean \pm SD
Bedrock Geology		
Alluvium (%)	0.00000	0.00000 \pm 0.00000
Intrusive (%)	0.00000	0.46153 \pm 2.09955
Metamorphic (%)	0.00000	0.17691 \pm 0.85012
Sedimentary (%)	100.00000	99.36155 \pm 2.22799
Ultramafic (%)	0.00000	0.00000 \pm 0.00000
Volcanic (%)	0.00000	0.00000 \pm 0.00000
Channel		
Depth-Avg (cm)	6.4	21.5 \pm 9.7
Depth-BankfullMinusWetted (cm)	54.00	38.14 \pm 36.11
Depth-Max (cm)	16.0	31.0 \pm 16.5
Macrophyte (PercentRange)	0	0 \pm 0
Reach-%CanopyCoverage (PercentRange)	1.00	1.54 \pm 1.28
Reach-DomStreamsideVeg (Category (1-4))	3	3 \pm 1
Reach-Pools (Binary)	0	1 \pm 0
Reach-Rapids (Binary)	0	0 \pm 0
Reach-Riffles (Binary)	1	1 \pm 0
Reach-StraightRun (Binary)	1	0 \pm 1
Slope (m/m)	0.0380000	0.0581357 \pm 0.0554952
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)	0.30	0.51 \pm 0.27
Velocity-Max (m/s)	0.63	0.78 \pm 0.40
Width-Bankfull (m)	11.8	13.7 \pm 16.4
Width-Wetted (m)	5.8	9.0 \pm 13.1
XSEC-VelMethod (Category (1-3))	1	2 \pm 1
Climate		
Precip01_JAN (mm)	83.00000	130.45668 \pm 67.17180
Precip02_FEB (mm)	54.00000	102.48242 \pm 52.12836
Precip03_MAR (mm)	40.00000	89.80929 \pm 42.79174
Precip04_APR (mm)	83.00000	135.11134 \pm 66.06707
Precip05_MAY (mm)	46.00000	70.51109 \pm 13.79432
Precip06_JUN (mm)	60.00000	86.65922 \pm 19.93623
Precip07_JUL (mm)	61.00000	79.11475 \pm 19.88523
Precip08_AUG (mm)	58.00000	76.86606 \pm 21.34619
Precip09_SEP (mm)	51.00000	71.16784 \pm 23.11306
Precip10_OCT (mm)	56.00000	88.14083 \pm 44.84739
Precip11_NOV (mm)	78.00000	134.64587 \pm 63.61897
Precip12_DEC (mm)	87.00000	142.32359 \pm 65.85239
PrecipTotal_ANNUAL (mm)	714.00000	1143.02476 \pm 453.62461
Temp01_JANMax (Degrees Celsius)	-6.00000	-6.18206 \pm 1.69263
Temp01_JANmin (Degrees Celsius)	-13.00000	-13.62029 \pm 2.05208
Temp02_FEBmax (Degrees Celsius)	-1.00000	-2.89816 \pm 1.88421
Temp02_FEBmin (Degrees Celsius)	-10.00000	-11.14625 \pm 1.99282
Temp03_MARmax (Degrees Celsius)	4.00000	0.98920 \pm 2.35950
Temp03_MARmin (Degrees Celsius)	-6.00000	-7.98295 \pm 1.94687
Temp04_APRmax (Degrees Celsius)	10.00000	5.37616 \pm 3.02243
Temp04_APRmin (Degrees Celsius)	-2.00000	-3.74673 \pm 1.66191
Temp05_MAYmax (Degrees Celsius)	15.00000	10.12548 \pm 3.18022
Temp05_MAYmin (Degrees Celsius)	1.00000	0.09616 \pm 1.15628
Temp06_JUNMax (Degrees Celsius)	19.00000	13.85415 \pm 3.23839

Habitat Description

Variable	NAHOR02	Predicted Group Reference Mean \pm SD
Temp06_JUNMin (Degrees Celsius)	5.00000	2.79527 \pm 1.60213
Temp07_JULmax (Degrees Celsius)	22.00000	17.45582 \pm 3.27590
Temp07_JULmin (Degrees Celsius)	7.00000	4.99257 \pm 1.52992
Temp08_AUGmax (Degrees Celsius)	22.00000	17.36896 \pm 3.11866
Temp08_AUGmin (Degrees Celsius)	6.00000	4.84827 \pm 1.46649
Temp09_SEPmax (Degrees Celsius)	16.00000	12.13974 \pm 2.86510
Temp09_SEPmin (Degrees Celsius)	2.00000	1.12535 \pm 1.20660
Temp10_OCTmax (Degrees Celsius)	8.00000	5.04078 \pm 2.46521
Temp10_OCTmin (Degrees Celsius)	-1.00000	-2.41023 \pm 1.18961
Temp11_NOVmax (Degrees Celsius)	0.00000	-2.24818 \pm 1.93047
Temp11_NOVmin (Degrees Celsius)	-7.00000	-8.35137 \pm 1.96467
Temp12_DECmax (Degrees Celsius)	-6.00000	-6.49458 \pm 1.76429
Temp12_DECmin (Degrees Celsius)	-12.00000	-12.72330 \pm 1.87798
TempANNUALmax (Degrees Celsius)	8.00000	5.16639 \pm 2.57569
TempANNUALmean (Degrees Celsius)	3.00000	0.71683 \pm 1.81248
TempANNUALmin (Degrees Celsius)	-2.00000	-3.38604 \pm 1.60598
Hydrology		
Drainage-Area (km ²)	23.84194	135.66658 \pm 373.96803
Perimeter (Km)	34.59989	55.78285 \pm 83.00734
StreamDensity (m/km ²)	2757.66254	2198.74079 \pm 886.68339
StreamLength (m)	65748.03	293250.33 \pm 851854.38
Landcover		
Natl-AnnCrops (%)	0.00000	0.00000 \pm 0.00000
Natl-Barren (%)	0.00000	0.00000 \pm 0.00000
Natl-BroadleafDense (%)	0.00000	0.00523 \pm 0.02638
Natl-BroadleafOpen (%)	1.66113	1.35705 \pm 2.04550
Natl-BroadleafSparse (%)	0.00000	0.31953 \pm 0.53788
Natl-Coniferous (%)	0.00000	0.00000 \pm 0.00000
Natl-ConiferousDense (%)	2.08345	4.95677 \pm 7.46543
Natl-ConiferousOpen (%)	45.69524	34.34335 \pm 18.65764
Natl-ConiferousSparse (%)	5.63003	1.39163 \pm 1.60111
Natl-Deciduous (%)	0.00000	0.00000 \pm 0.00000
Natl-Developed (%)	0.00000	0.00002 \pm 0.00009
Natl-ExposedLand (%)	10.98581	16.95282 \pm 9.64125
Natl-Grassland (%)	8.24811	5.60615 \pm 5.17505
Natl-Herb (%)	0.24413	2.04978 \pm 2.79736
Natl-MixedForest (%)	0.00000	0.00000 \pm 0.00000
Natl-MixedwoodDense (%)	0.15478	0.02636 \pm 0.08976
Natl-MixedwoodOpen (%)	9.58942	2.10440 \pm 2.63686
Natl-MixedwoodSparse (%)	0.00000	0.01817 \pm 0.04448
Natl-PerennCropsPast (%)	0.00000	0.00000 \pm 0.00000
Natl-Rock/Rubble (%)	3.31291	6.97447 \pm 7.52078
Natl-Shrubland (%)	0.00000	0.00000 \pm 0.00000
Natl-ShrubLow (%)	6.49920	4.49178 \pm 5.44294
Natl-ShrubTall (%)	0.00000	0.33533 \pm 1.14136
Natl-SnowIce (%)	0.00000	7.70046 \pm 9.06096
Natl-Water (%)	0.00000	0.14384 \pm 0.45543
Natl-Wetland (%)	0.00000	0.00000 \pm 0.00000
Natl-WetlandHerb (%)	0.00000	0.00639 \pm 0.02401
Natl-WetlandShrub (%)	0.00000	0.00868 \pm 0.02574
Natl-WetlandTreed (%)	0.00000	0.00226 \pm 0.00959
Reg-Ice (%)	0.00000	3.06094 \pm 5.65390
Substrate Data		
%Bedrock (%)	0	1 \pm 1
%Boulder (%)	0	3 \pm 3
%Cobble (%)	49	64 \pm 17
%Gravel (%)	5	2 \pm 2
%Pebble (%)	46	31 \pm 16
%Sand (%)	0	0 \pm 0
%Silt+Clay (%)	0	0 \pm 0
D50 (cm)	6.00	19.61 \pm 30.65
Dg (cm)	5.8	20.3 \pm 30.8

Habitat Description

Variable	NAHOR02	Predicted Group Reference Mean \pm SD
Dominant-1st (Category(0-9))	6	7 \pm 1
Dominant-2nd (Category(0-9))	5	6 \pm 1
Embeddedness (Category(1-5))	4	4 \pm 1
PeriphytonCoverage (Category(1-5))	1	2 \pm 1
SurroundingMaterial (Category(0-9))	3	3 \pm 1
Topography		
ElevationMax (m)	2586.00000	2829.64865 \pm 315.67549
ElevationMin (m)	811.00000	1172.81081 \pm 249.32284
ElevationStdev (m)	365.04788	342.56455 \pm 77.02221
Reg-SlopeLT30% (%)	9.00000	16.26604 \pm 8.50298
Slope30-50% (%)	27.62815	28.13773 \pm 4.86732
Slope50-60% (%)	16.16695	14.11202 \pm 1.82185
SlopeAvg (%)	55.87465	56.75540 \pm 7.27461
SlopeGT60% (%)	41.06465	39.57775 \pm 9.82818
SlopeLT30% (%)	15.14024	18.17250 \pm 6.88627
SlopeMax (%)	229.09795	317.81636 \pm 141.61151
SlopeMin (%)	0.59331	0.79557 \pm 1.30240
SlopeStdev (%)	24.97949	29.56849 \pm 5.64880
Water Chemistry		
General-DO (mg/L)	9.0000000	11.0635135 \pm 0.9899052
General-pH (pH)	9.4	7.7 \pm 0.7
General-SpCond (μ S/cm)	340.2000000	160.3567568 \pm 118.4083015
General-TempAir (Degrees Celsius)	32.0	10.5 \pm 0.7
General-TempWater (Degrees Celsius)	10.3000000	5.5262162 \pm 1.8860693
General-Turbidity (NTU)	1.1300000	0.1015000 \pm 0.0459619

Site Description

Study Name	CBWQ-Upper Columbia
Site	NAHOR02
Sampling Date	Sep 24 2014
Know Your Watershed Basin	Upper Columbia
Province / Territory	British Columbia
Terrestrial Ecological Classification	Montane Cordillera EcoZone Southern Rocky Mountain Trench EcoRegion
Coordinates (decimal degrees)	51.21306 N, 116.89211 W
Altitude	2700
Local Basin Name	Horse Cr
	Columbia
Stream Order	4



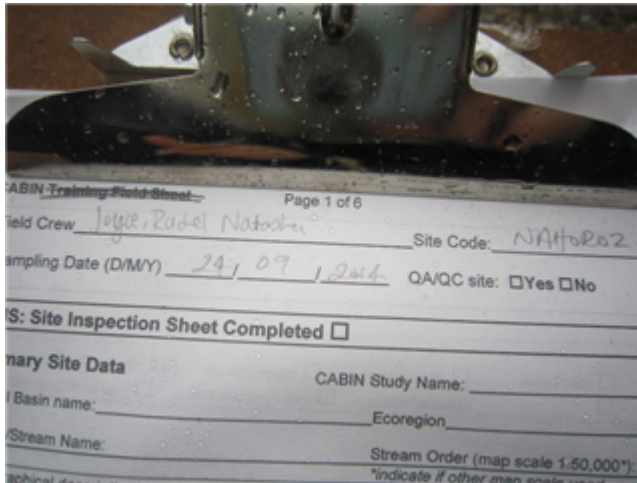
Figure 1. Location Map



Across Reach
Aerial (No image found)



Down Stream



Field Sheet

Miscellaneous (No image found)
 Substrate (No image found)



Up Stream

Cabin Assessment Results

Reference Model Summary	
Model	Columbia-Okanagan Preliminary March 2010
Analysis Date	November 01, 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	0.1%	0.1%	9.9%	10.7%	79.2%
CABIN Assessment of NAHOR02 on Sep 24, 2014	Mildly Divergent				

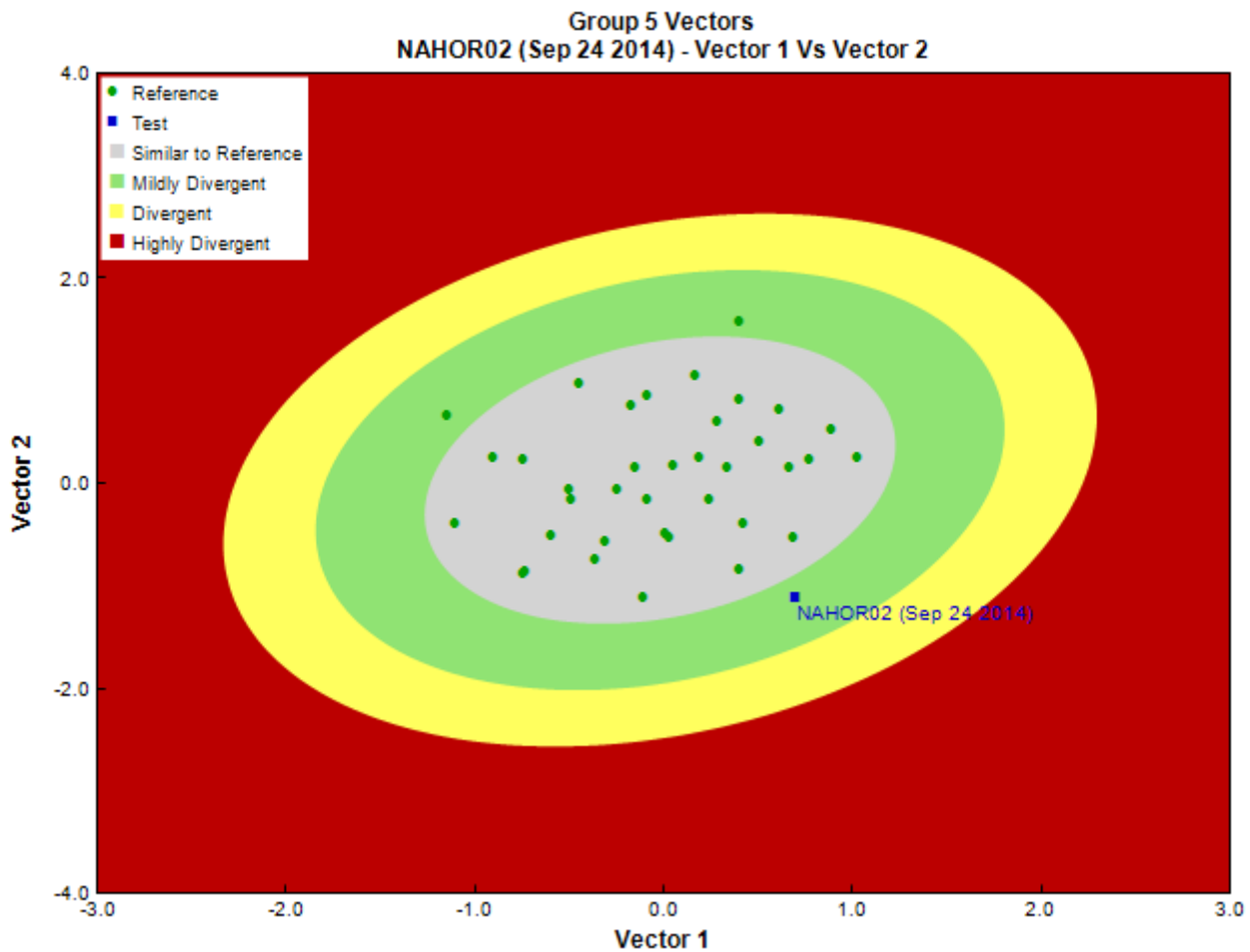


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

Sample Information

Sampling Device	Kick Net
Mesh Size	400
Sampling Time	3
Taxonomist	-
Date Taxonomy Completed	-
Sub-Sample Proportion	48/100

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
Arthropoda	Insecta	Coleoptera	Curculionidae	2	4.2
		Diptera	Ceratopogonidae	4	8.3
			Chironomidae	14	29.2
			Empididae	8	16.7
		Ephemeroptera	Ameletidae	1	2.1
			Baetidae	16	33.3
			Ephemerellidae	1	2.1
			Heptageniidae	22	45.8
		Plecoptera		9	18.8
			Capniidae	30	62.5
			Chloroperlidae	17	35.5
			Leuctridae	1	2.1
			Nemouridae	78	162.5
			Perlodidae	6	12.5
			Taeniopterygidae	99	206.3
		Trichoptera	Brachycentridae	1	2.1
			Rhyacophilidae	2	4.2
			Total	311	648.2

Metrics

Name	NAHOR02	Predicted Group Reference Mean \pm SD
Bray-Curtis Distance	0.49	0.4 \pm 0.1
Biotic Indices		
Hilsenhoff Family index (North-West)	2.4	2.8 \pm 0.3
Intolerant taxa	--	1.0 \pm 0.0
Long-lived taxa	--	1.0 \pm 0.0
Tolerant individuals (%)	--	0.3
Functional Measures		
% Filterers	0.3	1.7 \pm 1.7
% Gatherers	69.1	50.6 \pm 14.6
% Predatores	16.4	15.3 \pm 9.0
% Scrapers	50.8	67.2 \pm 16.8
% Shredder	67.8	38.1 \pm 18.2
No. Clinger Taxa	18.0	19.8 \pm 3.4
Number Of Individuals		
% Chironomidae	4.6	4.6 \pm 5.0
% Coleoptera	0.7	0.0 \pm 0.0
% Diptera + Non-insects	8.6	6.3 \pm 5.3
% Ephemeroptera	13.2	44.9 \pm 17.3
% Ephemeroptera that are Baetidae	40.0	26.1 \pm 20.5
% EPT Individuals	90.7	93.7 \pm 5.3
% Odonata	--	0.0 \pm 0.0
% of 2 dominant taxa	58.6	60.2 \pm 11.4
% of 5 dominant taxa	81.5	84.5 \pm 5.9
% of dominant taxa	32.8	39.3 \pm 12.3
% Plecoptera	76.5	42.9 \pm 17.2
% Tribe Tanyatarisini	--	
% Trichoptera that are Hydropsychida	0.0	27.4 \pm 27.1
% Tricoptera	1.0	5.8 \pm 5.7
No. EPT individuals/Chironomids+EPT Individuals	1.0	1.0 \pm 0.1
Total Abundance	647.9	2163.6 \pm 1274.4
Richness		
Chironomidae taxa (genus level only)	1.0	0.9 \pm 0.2
Coleoptera taxa	1.0	0.1 \pm 0.2
Diptera taxa	3.0	2.4 \pm 1.0
Ephemeroptera taxa	4.0	3.7 \pm 0.5
EPT Individuals (Sum)	570.8	2023.9 \pm 1195.7
EPT taxa (no)	12.0	12.3 \pm 1.9
Odonata taxa	--	0.0 \pm 0.0
Pielou's Evenness	0.7	0.7 \pm 0.1
Plecoptera taxa	6.0	5.5 \pm 1.1

Metrics

Name	NAHOR02	Predicted Group Reference Mean \pm SD
Shannon-Wiener Diversity	2.0	1.9 \pm 0.3
Simpson's Diversity	0.8	0.8 \pm 0.1
Simpson's Evenness	0.3	0.3 \pm 0.1
Total No. of Taxa	16.0	16.0 \pm 3.0
Trichoptera taxa	2.0	3.2 \pm 1.0

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NAHOR02
	Group 1	Group 2	Group 3	Group 4	Group 5	
Baetidae	100%	100%	100%	100%	97%	0.98
Chironomidae	100%	100%	100%	100%	95%	0.96
Chloroperlidae	78%	88%	94%	100%	100%	0.99
Ephemereididae	78%	100%	100%	100%	100%	1.00
Heptageniidae	100%	100%	100%	100%	100%	1.00
Hydropsychidae	11%	92%	78%	92%	86%	0.86
Nemouridae	100%	100%	100%	100%	100%	1.00
Perlodidae	78%	78%	89%	92%	81%	0.83
Rhyacophilidae	100%	92%	100%	100%	95%	0.96
Taeniopterygidae	89%	49%	100%	92%	97%	0.97

RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	12.58
RIVPACS : Observed taxa P>0.50	13.00
RIVPACS : O:E (p > 0.5)	1.03
RIVPACS : Expected taxa P>0.70	9.55
RIVPACS : Observed taxa P>0.70	9.00
RIVPACS : O:E (p > 0.7)	0.94

Habitat Description

Variable	NAHOR02	Predicted Group Reference Mean \pm SD
Bedrock Geology		
Alluvium (%)	0.00000	0.00000 \pm 0.00000
Intrusive (%)	0.00000	0.46153 \pm 2.09955
Metamorphic (%)	0.00000	0.17691 \pm 0.85012
Sedimentary (%)	100.00000	99.36155 \pm 2.22799
Ultramafic (%)	0.00000	0.00000 \pm 0.00000
Volcanic (%)	0.00000	0.00000 \pm 0.00000
Channel		
Depth-Avg (cm)	11.5	21.5 \pm 9.7
Depth-BankfullMinusWetted (cm)	85.50	38.14 \pm 36.11
Depth-Max (cm)	17.5	31.0 \pm 16.5
Macrophyte (PercentRange)	0	0 \pm 0
Reach-%CanopyCoverage (PercentRange)	1.00	1.54 \pm 1.28
Reach-DomStreamsideVeg (Category (1-4))	3	3 \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	0 \pm 1
Slope (m/m)	0.0380000	0.0581357 \pm 0.0554952
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)	0.40	0.51 \pm 0.27
Velocity-Max (m/s)	0.63	0.78 \pm 0.40
Width-Bankfull (m)	12.6	13.7 \pm 16.4
Width-Wetted (m)	3.3	9.0 \pm 13.1
XSEC-VelMethod (Category (1-3))	1	2 \pm 1

Habitat Description

Variable	NAHOR02	Predicted Group Reference Mean \pm SD
Climate		
Precip01_JAN (mm)	83.00000	130.45668 \pm 67.17180
Precip02_FEB (mm)	54.00000	102.48242 \pm 52.12836
Precip03_MAR (mm)	40.00000	89.80929 \pm 42.79174
Precip04_APR (mm)	83.00000	135.11134 \pm 66.06707
Precip05_MAY (mm)	46.00000	70.51109 \pm 13.79432
Precip06_JUN (mm)	60.00000	86.65922 \pm 19.93623
Precip07_JUL (mm)	61.00000	79.11475 \pm 19.88523
Precip08_AUG (mm)	58.00000	76.86606 \pm 21.34619
Precip09_SEP (mm)	51.00000	71.16784 \pm 23.11306
Precip10_OCT (mm)	56.00000	88.14083 \pm 44.84739
Precip11_NOV (mm)	78.00000	134.64587 \pm 63.61897
Precip12_DEC (mm)	87.00000	142.32359 \pm 65.85239
PrecipTotal_ANNUAL (mm)	714.00000	1143.02476 \pm 453.62461
Temp01_JANMax (Degrees Celsius)	-6.00000	-6.18206 \pm 1.69263
Temp01_JANmin (Degrees Celsius)	-13.00000	-13.62029 \pm 2.05208
Temp02_FEBmax (Degrees Celsius)	-1.00000	-2.89816 \pm 1.88421
Temp02_FEBmin (Degrees Celsius)	-10.00000	-11.14625 \pm 1.99282
Temp03_MARmax (Degrees Celsius)	4.00000	0.98920 \pm 2.35950
Temp03_MARmin (Degrees Celsius)	-6.00000	-7.98295 \pm 1.94687
Temp04_APRmax (Degrees Celsius)	10.00000	5.37616 \pm 3.02243
Temp04_APRmin (Degrees Celsius)	-2.00000	-3.74673 \pm 1.66191
Temp05_MAYmax (Degrees Celsius)	15.00000	10.12548 \pm 3.18022
Temp05_MAYmin (Degrees Celsius)	1.00000	0.09616 \pm 1.15628
Temp06_JUNMax (Degrees Celsius)	19.00000	13.85415 \pm 3.23839
Temp06_JUNMin (Degrees Celsius)	5.00000	2.79527 \pm 1.60213
Temp07_JULmax (Degrees Celsius)	22.00000	17.45582 \pm 3.27590
Temp07_JULmin (Degrees Celsius)	7.00000	4.99257 \pm 1.52992
Temp08_AUGmax (Degrees Celsius)	22.00000	17.36896 \pm 3.11866
Temp08_AUGmin (Degrees Celsius)	6.00000	4.84827 \pm 1.46649
Temp09_SEPmax (Degrees Celsius)	16.00000	12.13974 \pm 2.86510
Temp09_SEPmin (Degrees Celsius)	2.00000	1.12535 \pm 1.20660
Temp10_OCTmax (Degrees Celsius)	8.00000	5.04078 \pm 2.46521
Temp10_OCTmin (Degrees Celsius)	-1.00000	-2.41023 \pm 1.18961
Temp11_NOVmax (Degrees Celsius)	0.00000	-2.24818 \pm 1.93047
Temp11_NOVmin (Degrees Celsius)	-7.00000	-8.35137 \pm 1.96467
Temp12_DECmax (Degrees Celsius)	-6.00000	-6.49458 \pm 1.76429
Temp12_DECmin (Degrees Celsius)	-12.00000	-12.72330 \pm 1.87798
TempANNUALmax (Degrees Celsius)	8.00000	5.16639 \pm 2.57569
TempANNUALmean (Degrees Celsius)	3.00000	0.71683 \pm 1.81248
TempANNUALmin (Degrees Celsius)	-2.00000	-3.38604 \pm 1.60598
Hydrology		
Drainage-Area (km ²)	23.84194	135.66658 \pm 373.96803
Perimeter (Km)	34.59989	55.78285 \pm 83.00734
StreamDensity (m/km ²)	2757.66254	2198.74079 \pm 886.68339
StreamLength (m)	65748.03	293250.33 \pm 851854.38
Landcover		
Natl-AnnCrops (%)	0.00000	0.00000 \pm 0.00000
Natl-Barren (%)	0.00000	0.00000 \pm 0.00000
Natl-BroadleafDense (%)	0.00000	0.00523 \pm 0.02638
Natl-BroadleafOpen (%)	1.66113	1.35705 \pm 2.04550
Natl-BroadleafSparse (%)	0.00000	0.31953 \pm 0.53788
Natl-Coniferous (%)	0.00000	0.00000 \pm 0.00000
Natl-ConiferousDense (%)	2.08345	4.95677 \pm 7.46543
Natl-ConiferousOpen (%)	45.69524	34.34335 \pm 18.65764
Natl-ConiferousSparse (%)	5.63003	1.39163 \pm 1.60111
Natl-Deciduous (%)	0.00000	0.00000 \pm 0.00000
Natl-Developed (%)	0.00000	0.00002 \pm 0.00009
Natl-ExposedLand (%)	10.98581	16.95282 \pm 9.64125
Natl-Grassland (%)	8.24811	5.60615 \pm 5.17505
Natl-Herb (%)	0.24413	2.04978 \pm 2.79736
Natl-MixedForest (%)	0.00000	0.00000 \pm 0.00000

Habitat Description

Variable	NAHOR02	Predicted Group Reference Mean \pm SD
Natl-MixedwoodDense (%)	0.15478	0.02636 \pm 0.08976
Natl-MixedwoodOpen (%)	9.58942	2.10440 \pm 2.63686
Natl-MixedwoodSparse (%)	0.00000	0.01817 \pm 0.04448
Natl-PerennCropsPast (%)	0.00000	0.00000 \pm 0.00000
Natl-Rock/Rubble (%)	3.31291	6.97447 \pm 7.52078
Natl-Shrubland (%)	0.00000	0.00000 \pm 0.00000
Natl-ShrubLow (%)	6.49920	4.49178 \pm 5.44294
Natl-ShrubTall (%)	0.00000	0.33533 \pm 1.14136
Natl-SnowIce (%)	0.00000	7.70046 \pm 9.06096
Natl-Water (%)	0.00000	0.14384 \pm 0.45543
Natl-Wetland (%)	0.00000	0.00000 \pm 0.00000
Natl-WetlandHerb (%)	0.00000	0.00639 \pm 0.02401
Natl-WetlandShrub (%)	0.00000	0.00868 \pm 0.02574
Natl-WetlandTreed (%)	0.00000	0.00226 \pm 0.00959
Reg-Ice (%)	0.00000	3.06094 \pm 5.65390
Sediment Chemistry		
Ag (ppm)	0.025	0.000 \pm 0.000
Al (ppm)	2270.000	0.007 \pm 0.007
As (ppm)	1.880	0.001 \pm 0.001
Ba (ppm)	159.000	0.111 \pm 0.082
Be (ppm)	0.200	0.000 \pm 0.000
Bi (ppm)	0.050	0.000 \pm 0.000
Ca (ppm)	172000.000	23.071 \pm 17.129
Cd (ppm)	0.111	0.000 \pm 0.000
Co (ppm)	1.570	0.000 \pm 0.000
Cr (ppm)	4.200	0.000 \pm 0.000
Cu (ppm)	2.650	0.000 \pm 0.000
Fe (ppm)	6690.000	0.005 \pm 0.003
Hg (ppm)	0.025	0.000 \pm 0.000
K (ppm)	353.000	0.325 \pm 0.299
Li (ppm)	5.100	0.001 \pm 0.001
Mg (ppm)	58700.000	7.667 \pm 6.332
Mn (ppm)	192.000	0.000 \pm 0.000
Mo (ppm)	1.070	0.001 \pm 0.000
Na (ppm)	50.000	0.889 \pm 0.729
Ni (ppm)	6.290	0.000 \pm 0.000
Pb (ppm)	4.890	0.000 \pm 0.000
Sb (ppm)	0.230	0.000 \pm 0.000
Se (ppm)	0.250	0.000 \pm 0.000
Sn (ppm)	0.500	0.000 \pm 0.000
Sr (ppm)	198.000	0.082 \pm 0.102
Ti (ppm)	7.800	0.001 \pm 0.000
Tl (ppm)	0.025	0.000 \pm 0.000
TP (ppm)	158.000	0.000 \pm 0.000
U (ppm)	0.330	0.000 \pm 0.000
V (ppm)	6.300	0.000 \pm 0.000
Zn (ppm)	16.100	0.001 \pm 0.001
Zr (ppm)	1.970	0.000 \pm 0.000
Substrate Data		
%Bedrock (%)	0	1 \pm 1
%Boulder (%)	1	3 \pm 3
%Cobble (%)	56	64 \pm 17
%Gravel (%)	7	2 \pm 2
%Pebble (%)	36	31 \pm 16
%Sand (%)	0	0 \pm 0
%Silt+Clay (%)	0	0 \pm 0
D50 (cm)	6.75	19.61 \pm 30.65
Dg (cm)	6.3	20.3 \pm 30.8
Dominant-1st (Category(0-9))	6	7 \pm 1
Dominant-2nd (Category(0-9))	5	6 \pm 1
Embeddedness (Category(1-5))	3	4 \pm 1
PeriphytonCoverage (Category(1-5))	1	2 \pm 1

Habitat Description

Variable	NAHOR02	Predicted Group Reference Mean \pm SD
SurroundingMaterial (Category(0-9))	3	3 \pm 1
Topography		
ElevationMax (m)	2586.00000	2829.64865 \pm 315.67549
ElevationMin (m)	811.00000	1172.81081 \pm 249.32284
ElevationStdev (m)	365.04788	342.56455 \pm 77.02221
Reg-SlopeLT30% (%)	15.14024	16.26604 \pm 8.50298
Slope30-50% (%)	27.62815	28.13773 \pm 4.86732
Slope50-60% (%)	16.16695	14.11202 \pm 1.82185
SlopeAvg (%)	55.87465	56.75540 \pm 7.27461
SlopeGT60% (%)	41.06465	39.57775 \pm 9.82818
SlopeMax (%)	229.09795	317.81636 \pm 141.61151
SlopeMin (%)	0.59331	0.79557 \pm 1.30240
SlopeStdev (%)	24.97949	29.56849 \pm 5.64880
Water Chemistry		
CO3 (mg/L)	0.2500000	0.0000000 \pm 0.0000000
General-Alkalinity (mg/L)	157.0000000	68.5944444 \pm 52.1098452
General-DO (mg/L)	8.0000000	11.0635135 \pm 0.9899052
General-pH (pH)	8.8	7.7 \pm 0.7
General-SpCond (μ S/cm)	373.1000000	160.3567568 \pm 118.4083015
General-TempAir (Degrees Celsius)	14.0	10.5 \pm 0.7
General-TempWater (Degrees Celsius)	11.0000000	5.5262162 \pm 1.8860693
General-Turbidity (NTU)	1.6000000	0.1015000 \pm 0.0459619
HCO3 (mg/L)	192.0000000	0.0000000 \pm 0.0000000
Nitrogen-NO2 (mg/L)	0.0025000	0.0074306 \pm 0.0217095
Nitrogen-NO2+NO3 (mg/L)	0.0340000	0.0315000 \pm 0.0316491
Nitrogen-NO3 (mg/L)	0.0340000	0.0699722 \pm 0.0547511
Phosphorus-OrthoP (mg/L)	0.0025000	0.0008750 \pm 0.0012583
Phosphorus-TP (mg/L)	0.0196000	0.0025000 \pm 0.0041986