

Site Description

Study Name	CBWQ-Elk
Site	NGALX-03
Sampling Date	Sep 12 2016
Know Your Watershed Basin	Central Kootenay
Province / Territory	British Columbia
Terrestrial Ecological Classification	Montane Cordillera EcoZone Northern Continental Divide EcoRegion
Coordinates (decimal degrees)	49.65544 N, 114.73069 W
Altitude	4278
Local Basin Name	Alexander Creek
	Elk River Watershed
Stream Order	4

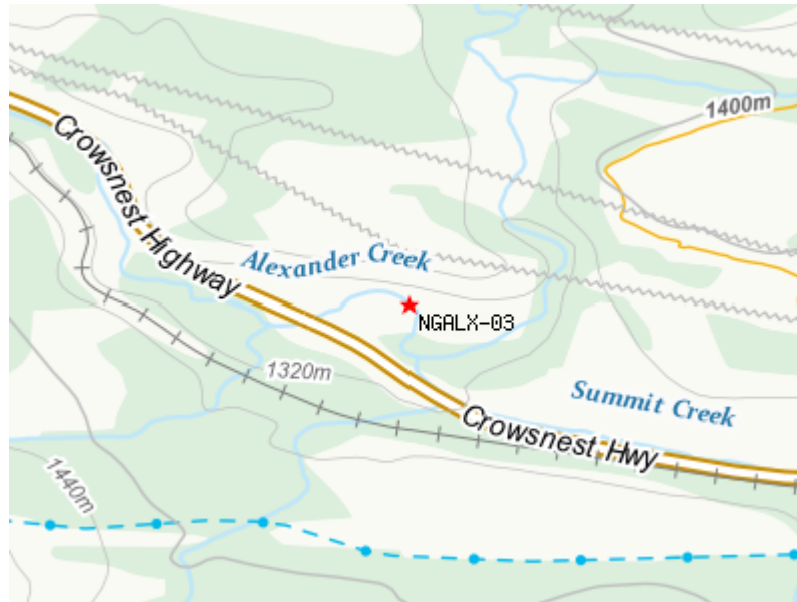


Figure 1. Location Map

Across Reach
Aerial (No image found)

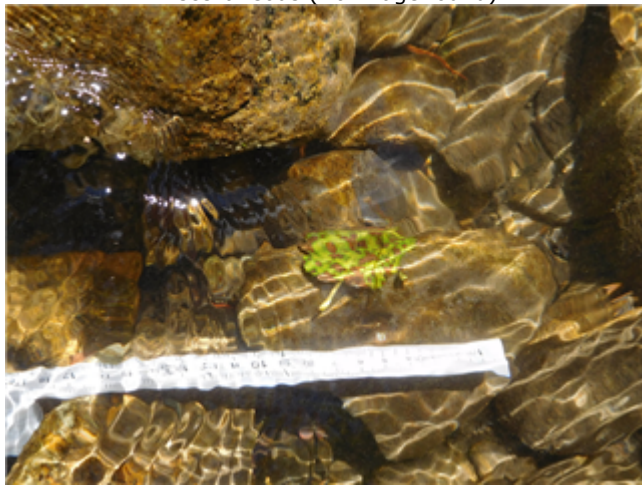


Down Stream



Field Sheet

Miscellaneous (No image found)



Substrate

Cabin Assessment Results

Reference Model Summary	
Model	Columbia-Okanagan Preliminary March 2010
Analysis Date	March 21, 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%	0.2%	85.9%	12.3%	1.5%
CABIN Assessment of NGALX-03 on Sep 12, 2016	Similar to Reference				

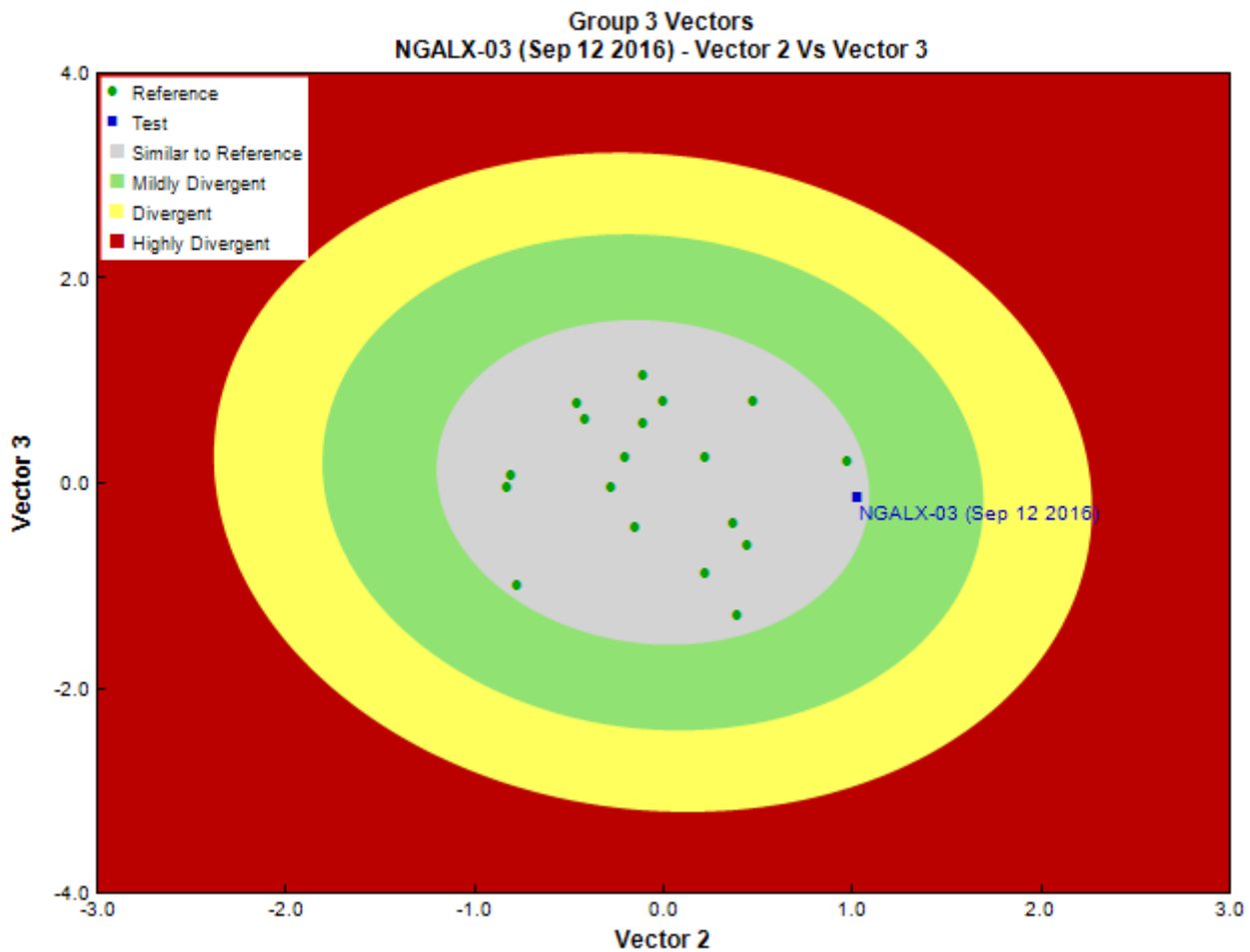


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

Sample Information

Sampling Device	Kick Net
Mesh Size	400
Sampling Time	3
Taxonomist	Pina Viola, Consultant
Date Taxonomy Completed	October 24, 2016
	Marchant Box
Sub-Sample Proportion	6/100

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
Arthropoda	Arachnida	Trombidiformes		1	16.7
			Hygrobatidae	1	16.7
			Lebertiidae	2	33.3
			Sperchontidae	1	16.7
	Insecta	Coleoptera	Elmidae	7	116.7
		Diptera	Ceratopogonidae	3	50.0
			Chironomidae	39	650.0
			Empididae	1	16.7
			Psychodidae	17	283.3
			Simuliidae	1	16.7
			Tipulidae	1	16.7
		Ephemeroptera	Ameletidae	2	33.3
			Baetidae	50	833.3
			Ephemerellidae	112	1,866.7
			Heptageniidae	44	733.3
		Plecoptera	Chloroperlidae	11	183.3
			Leuctridae	5	83.3
			Nemouridae	17	283.3
			Perlodidae	5	83.4
			Taeniopterygidae	4	66.7
		Trichoptera	Apataniidae	4	66.7
			Brachycentridae	1	16.7
			Glossosomatidae	81	1,350.0
			Hydropsychidae	2	33.4
			Rhyacophilidae	10	166.7
			Uenoidae	4	66.7
			Total	426	7,100.3

Metrics

Name	NGALX-03	Predicted Group Reference Mean \pm SD
Bray-Curtis Distance	0.58	0.4 \pm 0.2
Biotic Indices		
Hilsenhoff Family index (North-West)	2.5	3.2 \pm 0.7
Long-lived taxa	2.0	1.9 \pm 1.3
Tolerant individuals (%)	--	0.3
Functional Measures		
% Filterers	0.9	1.8 \pm 1.6
% Gatherers	51.2	52.4 \pm 14.6
% Predatores	17.8	18.3 \pm 13.3
% Scrapers	49.1	61.8 \pm 17.2
% Shredder	9.2	30.3 \pm 18.6
No. Clinger Taxa	28.0	19.8 \pm 3.9
Number Of Individuals		
% Chironomidae	9.2	8.2 \pm 13.6
% Coleoptera	1.6	0.8 \pm 1.9
% Diptera + Non-insects	15.5	14.3 \pm 14.2
% Ephemeroptera	48.9	43.3 \pm 15.7
% Ephemeroptera that are Baetidae	24.0	33.9 \pm 27.7
% EPT Individuals	82.8	84.9 \pm 14.3
% Odonata	--	0.0 \pm 0.0
% of 2 dominant taxa	45.4	58.9 \pm 10.0
% of 5 dominant taxa	76.7	83.8 \pm 7.3
% of dominant taxa	26.4	39.5 \pm 10.9
% Plecoptera	9.9	34.7 \pm 17.8
% Tribe Tanyatarisini	--	
% Trichoptera that are Hydropsychida	2.0	27.8 \pm 25.2
% Tricoptera	24.0	6.9 \pm 8.6
No. EPT individuals/Chironomids+EPT Individuals	0.9	0.9 \pm 0.1
Total Abundance	7100.0	5780.5 \pm 4895.3
Richness		
Chironomidae taxa (genus level only)	1.0	1.0 \pm 0.0

Metrics

Name	NGALX-03	Predicted Group Reference Mean \pm SD
Coleoptera taxa	1.0	0.4 \pm 0.6
Diptera taxa	6.0	3.4 \pm 1.0
Ephemeroptera taxa	4.0	3.4 \pm 0.5
EPT Individuals (Sum)	5866.7	4527.1 \pm 3161.8
EPT taxa (no)	15.0	11.5 \pm 1.2
Odonata taxa	--	0.0 \pm 0.0
Pielou's Evenness	0.7	0.7 \pm 0.1
Plecoptera taxa	5.0	5.3 \pm 0.9
Shannon-Wiener Diversity	2.3	1.9 \pm 0.3
Simpson's Diversity	0.9	0.8 \pm 0.1
Simpson's Evenness	0.3	0.3 \pm 0.1
Total No. of Taxa	25.0	17.7 \pm 2.6
Trichoptera taxa	6.0	2.8 \pm 1.0

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NGALX-03
	Group 1	Group 2	Group 3	Group 4	Group 5	
Baetidae	100%	100%	100%	100%	97%	1.00
Chironomidae	100%	100%	100%	100%	95%	1.00
Chloroperlidae	78%	88%	94%	100%	100%	0.95
Ephemereilidae	78%	100%	100%	100%	100%	1.00
Heptageniidae	100%	100%	100%	100%	100%	1.00
Hydropsychidae	11%	92%	78%	92%	86%	0.80
Nemouridae	100%	100%	100%	100%	100%	1.00
Perlodidae	78%	78%	89%	92%	81%	0.89
Psychodidae	22%	65%	94%	8%	11%	0.82
Rhyacophilidae	100%	92%	100%	100%	95%	1.00
Taeniopterygidae	89%	49%	100%	92%	97%	0.99

RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	12.69
RIVPACS : Observed taxa P>0.50	13.00
RIVPACS : O:E (p > 0.5)	1.02
RIVPACS : Expected taxa P>0.70	10.45
RIVPACS : Observed taxa P>0.70	11.00
RIVPACS : O:E (p > 0.7)	1.05

Habitat Description

Variable	NGALX-03	Predicted Group Reference Mean \pm SD
Channel		
Depth-Avg (cm)	29.7	22.5 \pm 10.5
Depth-BankfullMinusWetted (cm)	12.00	67.33 \pm 71.65
Depth-Max (cm)	35.6	32.9 \pm 17.9
Macrophyte (PercentRange)	0	0 \pm 0
Reach-%CanopyCoverage (PercentRange)	1.00	0.94 \pm 0.80
Reach-DomStreamsideVeg (Category (1-4))	1	3 \pm 1
Reach-Riffles (Binary)	1	1 \pm 0
Slope (m/m)	0.0096600	0.0235102 \pm 0.0284557
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)	0.62	0.50 \pm 0.25
Velocity-Max (m/s)	0.83	0.75 \pm 0.28
Width-Bankfull (m)	11.5	15.6 \pm 12.8
Width-Wetted (m)	9.5	10.2 \pm 7.0
XSEC-VelMethod (Category (1-3))	1	2 \pm 1
Landcover		

Habitat Description

Variable	NGALX-03	Predicted Group Reference Mean \pm SD
Reg-Ice (%)	0.00000	0.46949 \pm 1.15785
Substrate Data		
%Bedrock (%)	0	0 \pm 0
%Boulder (%)	5	6 \pm 7
%Cobble (%)	59	61 \pm 27
%Gravel (%)	13	1 \pm 2
%Pebble (%)	19	31 \pm 28
%Sand (%)	3	0 \pm 0
%Silt+Clay (%)	1	0 \pm 1
D50 (cm)	8.75	79.45 \pm 47.98
Dg (cm)	4.8	73.9 \pm 48.0
Dominant-1st (Category(0-9))	6	6 \pm 1
Dominant-2nd (Category(0-9))	7	6 \pm 2
Embeddedness (Category(1-5))	5	4 \pm 1
PeriphytonCoverage (Category(1-5))	3	2 \pm 1
SurroundingMaterial (Category(0-9))	2	3 \pm 1
Topography		
Reg-SlopeLT30% (%)	37.34105	27.92073 \pm 14.83033
Water Chemistry		
Ag (mg/L)	0.0000100	0.0000004 \pm 0.0000014
Al (mg/L)	0.0032000	0.0059500 \pm 0.0039700
As (mg/L)	0.0001100	0.0002175 \pm 0.0001795
B (mg/L)	0.0250000	0.0500000
Ba (mg/L)	0.0661000	0.0639025 \pm 0.0450861
Be (mg/L)	0.0000500	0.0000025 \pm 0.0000062
Bi (mg/L)	0.0005000	0.0000004 \pm 0.0000014
Ca (mg/L)	47.6000000	38.6142857 \pm 14.8464843
Cd (mg/L)	0.0000050	0.0000059 \pm 0.0000067
Chloride-Dissolved (mg/L)	1.1000000	3.5428571 \pm 8.1653449
Co (mg/L)	0.0002500	0.0000043 \pm 0.0000057
CO3 (mg/L)	2.4700000	0.0000000 \pm 0.0000000
Cr (mg/L)	0.0005000	0.0000833 \pm 0.0001403
Cu (mg/L)	0.0002500	0.0001875 \pm 0.0001434
Fe (mg/L)	0.0150000	0.0090000
General-Alkalinity (mg/L)	150.0000000	121.5944444 \pm 36.7225924
General-DO (mg/L)	11.0000000	10.4922222 \pm 0.8833463
General-Hardness (mg/L)	169.0000000	146.8222222 \pm 41.6699011
General-pH (pH)	8.6	8.0 \pm 0.6
General-SolidsTSS (mg/L)	2.0000000	0.5604289 \pm 1.4627232
General-SpCond (μ S/cm)	312.6000000	214.2437500 \pm 77.1891440
General-TempAir (Degrees Celsius)	7.0	10.5 \pm 4.2
General-TempWater (Degrees Celsius)	6.0000000	6.6716667 \pm 2.0277755
General-Turbidity (NTU)	1.3000000	0.0000000 \pm 0.0000000
HCO3 (mg/L)	178.0000000	0.0000000 \pm 0.0000000
Hg (ng/L)	5.0000000	0.0000000 \pm 0.0000000
K (mg/L)	0.3760000	0.6471429 \pm 0.7154652
Li (mg/L)	0.0025000	0.0011817 \pm 0.0004768
Mg (mg/L)	12.3000000	9.8814286 \pm 6.1601202
Mn (mg/L)	0.0015000	0.0011426 \pm 0.0016097
Mo (mg/L)	0.0005000	0.0024883 \pm 0.0065339
Na (mg/L)	1.3400000	2.6357143 \pm 3.7712414
Ni (mg/L)	0.0005000	0.0000808 \pm 0.0000811
Nitrogen-NO2 (mg/L)	0.0025000	0.0023889 \pm 0.0063351
Nitrogen-NO2+NO3 (mg/L)	0.0380000	0.0130000 \pm 0.0088111
Nitrogen-NO3 (mg/L)	0.0380000	0.0245003 \pm 0.0229452
Nitrogen-TN (mg/L)	0.1920000	0.0688889 \pm 0.0759171
Pb (mg/L)	0.0001000	0.0000224 \pm 0.0000176
Phosphorus-OrthoP (mg/L)	0.0025000	0.0035000 \pm 0.0018292
Phosphorus-TP (mg/L)	0.0025000	0.0032778 \pm 0.0061816
S (mg/L)	6.1000000	5.0000000
Sb (mg/L)	0.2500000	0.0000361 \pm 0.0000135
Se (mg/L)	0.0006000	0.0004382 \pm 0.0004486

Habitat Description

Variable	NGALX-03	Predicted Group Reference Mean \pmSD
Si (mg/L)	2.3100000	3.0657143 \pm 1.4070046
Sn (mg/L)	0.0025000	0.0000167 \pm 0.0000078
SO4 (mg/L)	17.3000000	14.9647059 \pm 10.8432549
Sr (mg/L)	0.1100000	0.1159167 \pm 0.0982749
Ti (mg/L)	0.0025000	0.0009000
Tl (mg/L)	0.0000250	0.0000038 \pm 0.0000064
U (mg/L)	0.0005800	0.0005298 \pm 0.0003220
V (mg/L)	0.0025000	0.0001642 \pm 0.0001203
Zn (mg/L)	0.0025000	0.0004083 \pm 0.0008361
Zr (mg/L)	0.0002500	0.0000000 \pm 0.0000000