

Site Description

Study Name	CBWQ-Salmo
Site	NESHP01
Sampling Date	Sep 20 2016
Know Your Watershed Basin	Central Columbia
Province / Territory	British Columbia
Terrestrial Ecological Classification	Montane Cordillera EcoZone Selkirk-Bitterroot Foothills EcoRegion
Coordinates (decimal degrees)	49.14128 N, 117.25862 W
Altitude	2198
Local Basin Name	Sheep Creek
	Columbia Basin
Stream Order	4

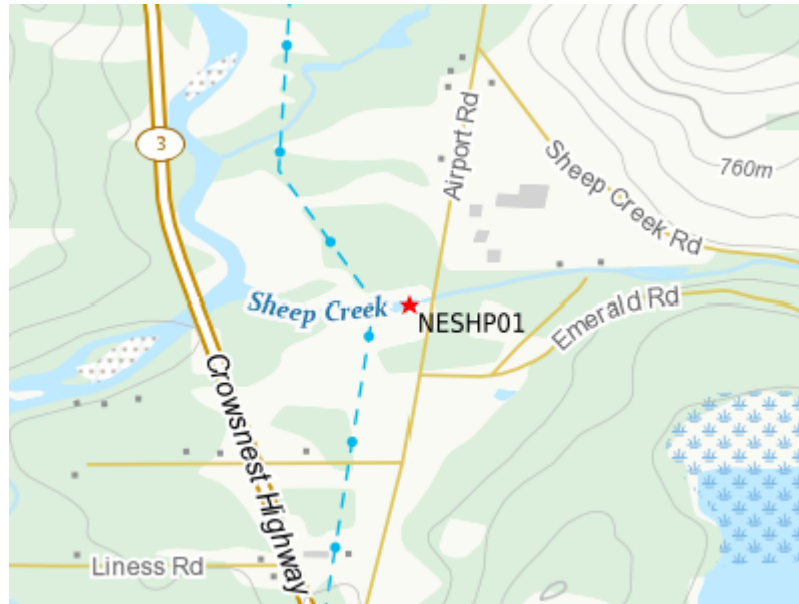
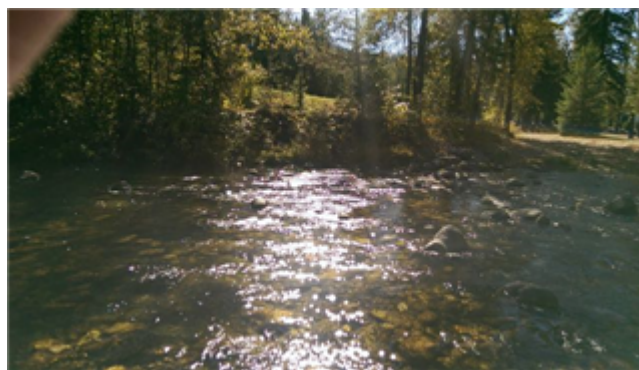


Figure 1. Location Map



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	December 12, 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	0.1%	7.6%	8.0%	82.0%	2.4%
CABIN Assessment of NESHP01 on Sep 20, 2016	Mildly Divergent				

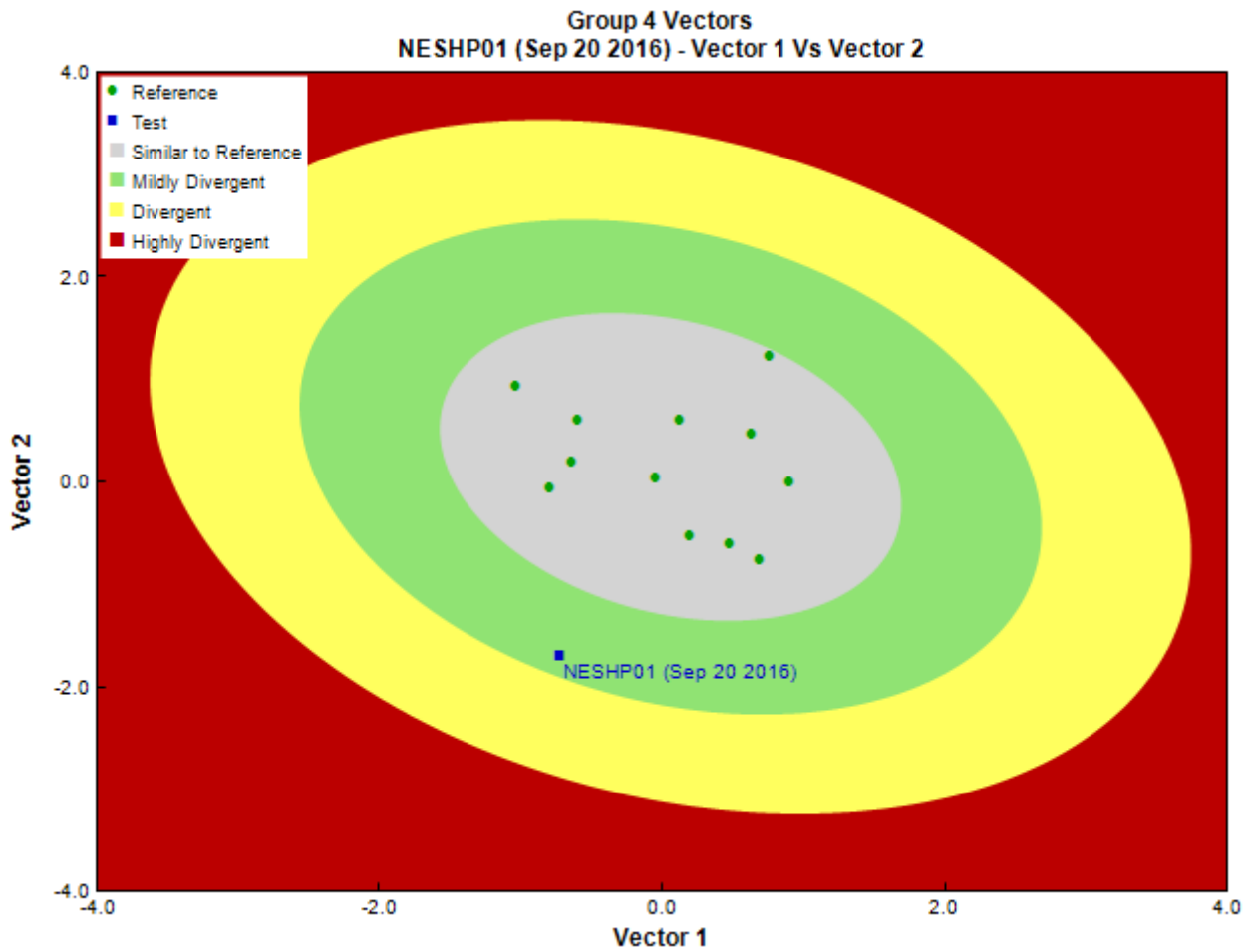


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

Sample Information

Sampling Device	Kick Net
Mesh Size	400
Sampling Time	3
Taxonomist	Pina Viola, Consultant
Date Taxonomy Completed	October 22, 2016
	Marchant Box
Sub-Sample Proportion	8/100

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
Annelida	Oligochaeta			3	37.5
		Lumbriculida	Lumbriculidae	1	12.5
Arthropoda	Arachnida	Trombidiformes		1	12.5
			Hydryphantidae	3	37.5
			Hygrobatidae	2	25.0
			Lebertiidae	8	100.0
			Sperchontidae	5	62.5
			Torrenticolidae	18	225.0
	Insecta	Coleoptera	Dytiscidae	1	12.5
			Elmidae	20	250.0
		Diptera	Ceratopogonidae	1	12.5
			Chironomidae	82	1,025.0
			Psychodidae	16	200.0
			Tipulidae	10	125.0
		Ephemeroptera	Ameletidae	7	87.5

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
			Baetidae	10	125.0
			Ephemerellidae	40	500.0
			Heptageniidae	80	1,000.0
			Leptophlebiidae	9	112.5
		Plecoptera	Capniidae	1	12.5
			Chloroperlidae	1	12.5
			Nemouridae	2	25.0
			Perlodidae	2	25.0
		Trichoptera	Brachycentridae	24	300.0
			Glossosomatidae	2	25.0
			Hydropsychidae	1	12.5
			Hydroptilidae	1	12.5
			Lepidostomatidae	22	275.0
			Limnephilidae	2	25.0
			Rhyacophilidae	3	37.5
			Total	378	4,725.0

Metrics

Name	NESHPO1	Predicted Group Reference Mean \pm SD
Bray-Curtis Distance	0.86	0.4 \pm 0.1
Biotic Indices		
Hilsenhoff Family index (North-West)	4.1	3.2 \pm 0.3
Intolerant taxa	--	
Long-lived taxa	4.0	2.1 \pm 1.0
Tolerant individuals (%)	0.3	0.8 \pm 0.3
Functional Measures		
% Filterers	6.6	2.2 \pm 1.8
% Gatherers	56.6	38.4 \pm 12.4
% Predatores	33.6	19.0 \pm 8.5
% Scrapers	31.0	63.2 \pm 19.7
% Shredder	21.4	27.6 \pm 15.2
No. Clinger Taxa	26.0	23.2 \pm 6.3
Number Of Individuals		
% Chironomidae	21.9	7.4 \pm 6.4
% Coleoptera	5.6	1.5 \pm 3.9
% Diptera + Non-insects	39.0	10.8 \pm 7.6
% Ephemeroptera	39.0	51.7 \pm 18.8
% Ephemeroptera that are Baetidae	6.8	40.6 \pm 30.0
% EPT Individuals	55.3	87.7 \pm 7.4
% Odonata	--	0.0 \pm 0.0
% of 2 dominant taxa	43.3	57.9 \pm 14.2
% of 5 dominant taxa	66.3	81.6 \pm 7.9
% of dominant taxa	21.9	39.8 \pm 14.9
% Plecoptera	1.6	31.4 \pm 15.4
% Tribe Tanyatarisini	--	
% Trichoptera that are Hydropsychida	1.8	27.0 \pm 26.2
% Tricoptera	14.7	4.5 \pm 2.8
No. EPT individuals/Chironomids+EPT Individuals	0.7	0.9 \pm 0.1
Total Abundance	4725.0	587.4 \pm 299.1
Richness		
Chironomidae taxa (genus level only)	1.0	1.0 \pm 0.0
Coleoptera taxa	2.0	0.4 \pm 0.5
Diptera taxa	4.0	3.3 \pm 1.0
Ephemeroptera taxa	5.0	3.8 \pm 0.8
EPT Individuals (Sum)	2587.5	526.0 \pm 285.8
EPT taxa (no)	16.0	13.3 \pm 2.7
Odonata taxa	--	0.0 \pm 0.0
Pielou's Evenness	0.8	0.7 \pm 0.1
Plecoptera taxa	4.0	6.3 \pm 1.1
Shannon-Wiener Diversity	2.5	1.9 \pm 0.4
Simpson's Diversity	0.9	0.8 \pm 0.1

Metrics

Name	NESHPO1	Predicted Group Reference Mean \pm SD
Simpson's Evenness	0.3	0.3 \pm 0.1
Total No. of Taxa	28.0	19.3 \pm 3.7
Trichoptera taxa	7.0	3.2 \pm 1.4

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NESHPO1
	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%	0.91
Perlodidae	78%	78%	89%	92%	81%	0.90
Rhyacophilidae	100%	92%	100%	100%	95%	0.99
Taeniopterygidae	89%	49%	100%	92%	97%	0.89

RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	14.41
RIVPACS : Observed taxa P>0.50	13.00
RIVPACS : O:E (p > 0.5)	0.90
RIVPACS : Expected taxa P>0.70	11.43
RIVPACS : Observed taxa P>0.70	10.00
RIVPACS : O:E (p > 0.7)	0.87

Habitat Description

Variable	NESHPO1	Predicted Group Reference Mean \pm SD
Channel		
Depth-Avg (cm)	25.8	23.6 \pm 11.1
Depth-BankfullMinusWetted (cm)	192.00	51.38 \pm 29.42
Depth-Max (cm)	40.0	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))	2	4 \pm 1
Reach-Pools (Binary)	1	1 \pm 0
Reach-Riffles (Binary)	1	1 \pm 0
Reach-StraightRun (Binary)	1	1 \pm 1
Slope (m/m)	0.0250000	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)	0.50	0.48 \pm 0.22
Velocity-Max (m/s)	0.69	0.76 \pm 0.36
Width-Bankfull (m)	19.0	13.4 \pm 9.9
Width-Wetted (m)	15.0	8.5 \pm 5.8
XSEC-VelInstrumentDirect (Category (1-3))	3	0 \pm 0
XSEC-VelMethod (Category (1-3))	3	1 \pm 0
Landcover		
Reg-Ice (%)	0.00000	0.02487 \pm 0.06034
Substrate Data		
%Bedrock (%)	0	0 \pm 0
%Boulder (%)	11	9 \pm 9
%Cobble (%)	31	51 \pm 15
%Gravel (%)	9	3 \pm 3

Habitat Description

Variable	NESHPO1	Predicted Group Reference Mean \pm SD
%Pebble (%)	41	37 \pm 20
%Sand (%)	0	0 \pm 0
%Silt+Clay (%)	8	0 \pm 0
D50 (cm)	5.00	15.12 \pm 14.26
Dg (cm)	3.9	8.2 \pm 2.8
Dominant-1st (Category(0-9))	6	7 \pm 1
Dominant-2nd (Category(0-9))	5	7 \pm 1
Embeddedness (Category(1-5))	5	5 \pm 1
PeriphytonCoverage (Category(1-5))	2	1 \pm 0
SurroundingMaterial (Category(0-9))	2	4 \pm 1
Topography		
Reg-SlopeLT30% (%)	19.60980	18.88386 \pm 9.29866
Water Chemistry		
Ag (mg/L)	0.0000100	0.0000050
Al (mg/L)	0.0137000	0.0049000
As (mg/L)	0.0001200	0.0002700
B (mg/L)	0.0250000	0.0500000
Ba (mg/L)	0.0228000	0.0682000
Be (mg/L)	0.0000500	0.0000100
Bi (mg/L)	0.0005000	0.0000050
Ca (mg/L)	17.3000000	21.1083333 \pm 16.8005659
Cd (mg/L)	0.0000950	0.0000050
Chloride-Dissolved (mg/L)	0.5000000	0.9750000 \pm 2.6309780
Co (mg/L)	0.0002500	0.0000100
CO3 (mg/L)	0.2500000	0.0000000 \pm 0.0000000
Cr (mg/L)	0.0005000	0.0001000
Cu (mg/L)	0.0002500	0.0001000
Fe (mg/L)	0.0050000	0.0080000
General-Alkalinity (mg/L)	46.7000000	71.7000000 \pm 53.9231440
General-DO (mg/L)	11.0000000	11.4175000 \pm 0.7986708
General-Hardness (mg/L)	54.5000000	84.2750000 \pm 70.6251066
General-pH (pH)	8.2	7.9 \pm 0.4
General-SolidsTSS (mg/L)	2.0000000	0.8849836 \pm 1.2378575
General-TempAir (Degrees Celsius)	12.0	26.0
General-TempWater (Degrees Celsius)	8.0000000	7.3183333 \pm 2.7240839
General-Turbidity (NTU)	0.4500000	0.2020000
HCO3 (mg/L)	56.9000000	0.0000000 \pm 0.0000000
Hg (ng/L)	5.0000000	0.0000000 \pm 0.0000000
K (mg/L)	0.5430000	0.6141667 \pm 0.4056971
Li (mg/L)	0.0025000	0.0011000
Mg (mg/L)	2.7100000	7.6666667 \pm 7.9748848
Mn (mg/L)	0.0005000	0.0006100
Mo (mg/L)	0.0005000	0.0006900
Na (mg/L)	0.8630000	1.5383333 \pm 1.2751459
Ni (mg/L)	0.0005000	0.0003000
Nitrogen-NO2 (mg/L)	0.0025000	0.0027500 \pm 0.0062831
Nitrogen-NO2+NO3 (mg/L)	0.0490000	0.0690000
Nitrogen-NO3 (mg/L)	0.0490000	0.0546667 \pm 0.0498148
Nitrogen-TN (mg/L)	0.1150000	0.0883333 \pm 0.0521943
Pb (mg/L)	0.0001000	0.0000520
Phosphorus-OrthoP (mg/L)	0.0063000	0.0002727 \pm 0.0004671
Phosphorus-TP (mg/L)	0.0095000	0.0045833 \pm 0.0049992
S (mg/L)	1.5000000	5.0000000
Sb (mg/L)	0.0002500	0.0000700
Se (mg/L)	0.0001600	0.0001200
Si (mg/L)	4.3800000	3.1516667 \pm 1.2277017
Sn (mg/L)	0.0025000	0.0000100
Sr (mg/L)	0.0545000	0.0443000
Ti (mg/L)	0.0025000	0.0005000
Tl (mg/L)	0.0000250	0.0000020
U (mg/L)	0.0004100	0.0011700
V (mg/L)	0.0025000	0.0002000

Habitat Description

Variable	NESHP01	Predicted Group Reference Mean \pmSD
Zn (mg/L)	0.0054000	0.0010000
Zr (mg/L)	0.0002500	0.0000000 \pm 0.0000000