

Site Description

Study Name	BC NGO-Goat River Ecological Monitoring
Site	GOA01
Sampling Date	Oct 01 2023
Know Your Watershed Basin	Lower Kootenay
Province / Territory	British Columbia
Terrestrial Ecological Classification	Montane Cordillera EcoZone Columbia Mountains and Highlands EcoRegion
Coordinates (decimal degrees)	49.08070 N, 116.51980 W
Altitude	541
Local Basin Name	Goat River
	Kootenay River
Stream Order	5



Up Stream

Cabin Assessment Results

Reference Model Summary						
Model	Columbia Basin 2020					
Analysis Date	October 22, 2024					
Taxonomic Level	Family					
Predictive Model Variables	Altitude Drainage-Area Longitude Natl-Grassland Natl-ShrubLow Natl-Water Precip10_Oct Reach-%CanopyCoverage Sedimentary Slope SlopeMax Temp12_DECmin					
Reference Groups	1	2	3	4	5	6
Number of Reference Sites	13	24	28	35	32	15
Group Error Rate	53.8%	55.2%	34.1%	52.2%	23.1%	29.4%
Overall Model Error Rate	39.4%					
Probability of Group Membership	13.1%	53.9%	13.3%	12.2%	2.6%	4.9%
CABIN Assessment of GOA01 on Oct 01, 2023	Mildly Divergent					

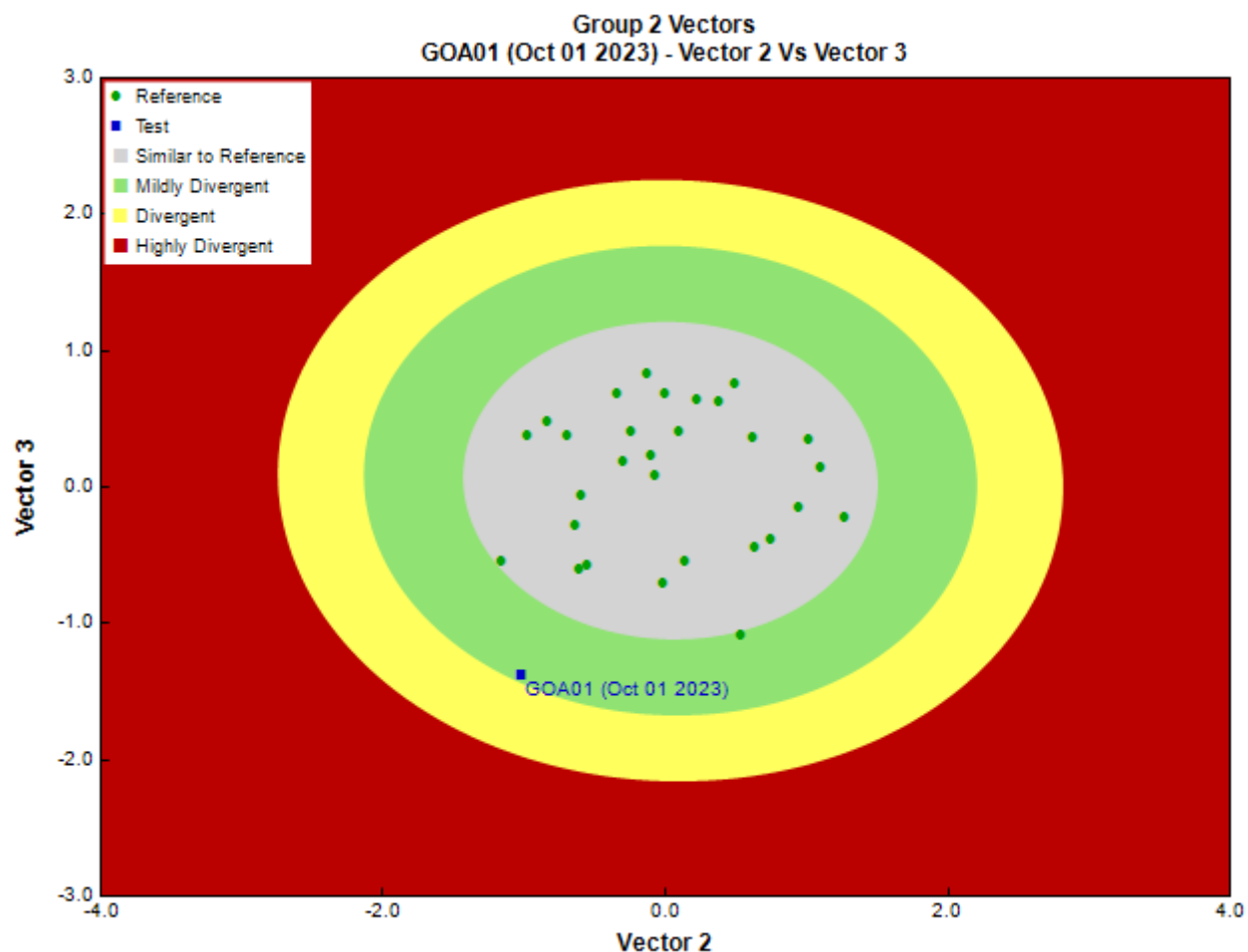


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

Sample Information

Sampling Device	Kick Net
Mesh Size	400
Sampling Time	3
Taxonomist	Pina Viola, Consultant
	Marchant Box
Sub-Sample Proportion	12/100

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
Annelida	Clitellata	Tubificida	Naididae	21	175.0
Arthropoda	Arachnida	Trombidiformes	Hygrobatidae	6	50.0
			Torrenticolidae	3	25.0
	Insecta	Coleoptera	Elmidae	3	25.0
			Chironomidae	47	391.7
		Diptera	Empididae	1	8.3
			Tipulidae	15	125.0
		Ephemeroptera	Ameletidae	5	41.7
			Baetidae	11	91.6
		Plecoptera	Ephemerellidae	54	450.0
			Heptageniidae	49	408.2
			Leptophlebiidae	60	500.0
			Chloroperlidae	2	16.7
			Leuctridae	1	8.3
			Perlidae	3	25.0
			Perlodidae	5	41.7

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
			Taeniopterygidae	6	50.0
		Trichoptera	Hydropsychidae	1	8.3
			Lepidostomatidae	2	16.7
			Total	295	2,458.2

Metrics

Name	GOA01	Predicted Group Reference Mean $\pm$ SD
Bray-Curtis Distance	0.74	0.3 $\pm$ 0.1
Biotic Indices		
Hilsenhoff Family index (North-West)	3.6	3.2 $\pm$ 0.3
Number Of Individuals		
% Chironomidae	15.9	6.0 $\pm$ 5.6
% EPT Individuals	67.5	88.1 $\pm$ 9.3
% of 2 dominant taxa	38.6	54.4 $\pm$ 11.4
No. EPT individuals/Chironomids+EPT Individuals	0.8	0.9 $\pm$ 0.1
Total Abundance	2458.3	1083.1 $\pm$ 932.3
Richness		
EPT taxa (no)	12.0	12.4 $\pm$ 2.4
Simpson's Diversity	0.9	0.8 $\pm$ 0.1
Simpson's Evenness	0.4	0.3 $\pm$ 0.1
Total No. of Taxa	19.0	18.2 $\pm$ 4.7

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites						Probability Of Occurrence at GOA01
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	
Baetidae	100%	100%	100%	100%	100%	100%	1.00
Capniidae	77%	79%	63%	74%	63%	76%	0.76
Chironomidae	100%	100%	100%	93%	100%	88%	0.99
Chloroperlidae	77%	93%	88%	93%	96%	82%	0.90
Ephemereillidae	85%	97%	98%	98%	98%	82%	0.95
Heptageniidae	92%	100%	100%	100%	100%	100%	0.99
Hydropsychidae	46%	72%	71%	91%	79%	53%	0.70
Nemouridae	85%	100%	98%	98%	98%	100%	0.97
Perlodidae	77%	97%	85%	83%	90%	82%	0.90
Rhyacophilidae	69%	100%	83%	91%	98%	82%	0.92
Taeniopterygidae	69%	97%	88%	100%	100%	88%	0.92

RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	12.34
RIVPACS : Observed taxa P>0.50	11.00
RIVPACS : O:E (p > 0.5)	0.89
RIVPACS : Expected taxa P>0.70	9.99
RIVPACS : Observed taxa P>0.70	8.00
RIVPACS : O:E (p > 0.7)	0.80

Habitat Description

Variable	GOA01	Predicted Group Reference Mean $\pm$ SD
Bedrock Geology		
Sedimentary (%)	90.91000	91.25558 $\pm$ 24.81348
Channel		
Depth-Avg (cm)	30.3	31.4 $\pm$ 15.4
Depth-BankfullMinusWetted (cm)	130.00	54.15 $\pm$ 36.59
Depth-Max (cm)	37.0	46.8 $\pm$ 23.7
Macrophyte (PercentRange)	1	0 $\pm$ 0
Reach-%CanopyCoverage (PercentRange)	0.00	1.00 $\pm$ 0.96
Reach-DomStreamsideVeg (Category(1-4))	3	3 $\pm$ 1

Habitat Description

Variable	GOA01	Predicted Group Reference Mean $\pm$ SD
Reach-Pools (Binary)	0	1 $\pm$ 1
Reach-Rapids (Binary)	0	0 $\pm$ 0
Reach-Riffles (Binary)	1	1 $\pm$ 0
Reach-StraightRun (Binary)	0	1 $\pm$ 1
Slope (m/m)	0.0060000	0.0435622 $\pm$ 0.0544263
Veg-Coniferous (Binary)	0	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	0.63 $\pm$ 0.23
Velocity-Max (m/s)	0.31	0.95 $\pm$ 0.33
Width-Bankfull (m)	98.0	23.6 $\pm$ 18.9
Width-Wetted (m)	46.3	14.0 $\pm$ 9.6
XSEC-VelInstrumentDirect (Category(1-3))	3	2 $\pm$ 0
XSEC-VelMethod (Category(1-3))	3	2 $\pm$ 1
Climate		
Precip10_OCT (mm)	65.43328	93.78954 $\pm$ 37.73803
Temp12_DECmin (Degrees Celsius)	-10.60250	-12.77499 $\pm$ 1.90440
Hydrology		
Drainage-Area (km^2)	1256.53600	267.49128 $\pm$ 347.95771
Perimeter (Km)	193.03860	107.09622 $\pm$ 85.97364
Landcover		
Natl-Grassland (%)	5.43000	4.84000 $\pm$ 3.39798
Natl-ShrubLow (%)	0.07000	4.94988 $\pm$ 4.53147
Natl-Water (%)	0.29000	0.22026 $\pm$ 0.32058
Substrate Data		
%Bedrock (%)	0	0 $\pm$ 1
%Boulder (%)	0	6 $\pm$ 7
%Cobble (%)	57	51 $\pm$ 23
%Gravel (%)	0	4 $\pm$ 6
%Pebble (%)	43	39 $\pm$ 23
%Sand (%)	0	0 $\pm$ 0
%Silt+Clay (%)	0	0 $\pm$ 0
D50 (cm)	7.30	8.79 $\pm$ 6.32
Dg (cm)	6.6	7.7 $\pm$ 3.1
Dominant-1st (Category(0-9))	6	6 $\pm$ 1
Dominant-2nd (Category(0-9))	5	6 $\pm$ 1
Embeddedness (Category(1-5))	4	4 $\pm$ 1
PeriphytonCoverage (Category(1-5))	2	2 $\pm$ 1
SurroundingMaterial (Category(0-9))	3	3 $\pm$ 1
Topography		
SlopeMax (%)	923.50000	475.68167 $\pm$ 413.51912
Water Chemistry		
Ag (mg/L)	0.0000250	0.0000038 $\pm$ 0.0000018
Al (mg/L)	0.0025000	0.0064450 $\pm$ 0.0021850
As (mg/L)	0.0002500	0.0002615 $\pm$ 0.0000120
B (mg/L)	0.0250000	0.0262500 $\pm$ 0.0335876
Ba (mg/L)	0.0118000	0.0683500 $\pm$ 0.0002121
Be (mg/L)	0.0000500	0.0000075 $\pm$ 0.0000035
Bi (mg/L)	0.0000500	0.0000038 $\pm$ 0.0000018
Ca (mg/L)	9.6600000	24.6363636 $\pm$ 20.0629852
Cd (mg/L)	0.0000050	0.0000038 $\pm$ 0.0000018
Co (mg/L)	0.0000500	0.0000114 $\pm$ 0.0000019
Cr (mg/L)	0.0002500	0.0000750 $\pm$ 0.0000354
Cu (mg/L)	0.0002000	0.0001155 $\pm$ 0.0000219
Fe (mg/L)	0.0210000	0.0105500 $\pm$ 0.0036062
General-Alkalinity (mg/L)	36.5000000	74.2125000 $\pm$ 53.9915558
General-Conductivity (μ S/cm)	59.2000000	121.7600000 $\pm$ 104.0053005
General-DO (mg/L)	11.3000000	11.0129630 $\pm$ 0.8955266
General-Hardness (mg/L)	36.6000000	95.8956522 $\pm$ 77.3576081
General-pH (pH)	7.8	7.7 $\pm$ 0.8
General-SolidsTSS (mg/L)	1.0000000	5.9463636 $\pm$ 8.6422279

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Variable	GOA01	Predicted Group Reference Mean $\pm$ SD
General-SpCond (μ S/cm)	80.7000000	165.1777778 $\pm$ 128.4575336
General-TempAir (Degrees Celsius)	17.0	11.5 $\pm$ 5.9
General-TempWater (Degrees Celsius)	11.7000000	6.4451852 $\pm$ 2.2997548
General-Turbidity (NTU)	0.2500000	5.7154545 $\pm$ 6.9690564
K (mg/L)	0.4600000	0.4604091 $\pm$ 0.2737828
Li (mg/L)	0.0003700	0.0011000 $\pm$ 0.0000000
Mg (mg/L)	3.0200000	8.6045455 $\pm$ 7.5439965
Mn (mg/L)	0.0015100	0.0007470 $\pm$ 0.0001937
Mo (mg/L)	0.0004700	0.0006780 $\pm$ 0.0000170
Na (mg/L)	2.0800000	1.0881818 $\pm$ 0.7163042
Ni (mg/L)	0.0002000	0.0001625 $\pm$ 0.0001945
Nitrogen-NO2 (mg/L)	0.0050000	0.0034091 $\pm$ 0.0048394
Nitrogen-NO2+NO3 (mg/L)	0.0050000	0.0789333 $\pm$ 0.0140433
Nitrogen-NO3 (mg/L)	0.0050000	0.0719000 $\pm$ 0.0408583
Nitrogen-TKN (mg/L)	0.0250000	0.0200000
Nitrogen-TN (mg/L)	0.0250000	0.0929091 $\pm$ 0.0373336
Pb (mg/L)	0.0001000	0.0000337 $\pm$ 0.0000259
Phosphorus-OrthoP (mg/L)	0.0085000	0.0005167 $\pm$ 0.0006974
Phosphorus-TDP (mg/L)	0.0025000	0.0010200 $\pm$ 0.0007879
Phosphorus-TP (mg/L)	0.0250000	0.0049864 $\pm$ 0.0043795
S (mg/L)	1.5000000	5.0000000
Sb (mg/L)	0.0001000	0.0000635 $\pm$ 0.0000092
Se (mg/L)	0.0002500	0.0001105 $\pm$ 0.0000134
Si (mg/L)	3.9000000	2.5681818 $\pm$ 1.4562562
Sn (mg/L)	0.0001000	0.0000075 $\pm$ 0.0000035
Sr (mg/L)	0.0356000	0.0445000 $\pm$ 0.0002828
Te (mg/L)	0.0002500	0.0000000 $\pm$ 0.0000000
Th (mg/L)	0.0000500	0.0000000 $\pm$ 0.0000000
Ti (mg/L)	0.0025000	0.0005000
Tl (mg/L)	0.0000100	0.0000015 $\pm$ 0.0000007
U (mg/L)	0.0004100	0.0012050 $\pm$ 0.0000495
V (mg/L)	0.0025000	0.0001500 $\pm$ 0.0000707
Zn (mg/L)	0.0020000	0.0006400 $\pm$ 0.0005091
Zr (mg/L)	0.0000500	0.0000000 $\pm$ 0.0000000