YUKON PLACER SECRETARIAT

Fish Habitat Management System for Yukon Placer Mining

Aquatic Health Monitoring Report (2010)

Prepared by

The Yukon Placer
Aquatic Health Working Group

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AQUATIC HEALTH MONITORING REPORT (2010)

The Adaptive Management Framework for Yukon placer mining is complemented by traditional knowledge and monitoring of water quality objectives, aquatic health, and economic health. The aquatic Health monitoring program is governed by the Aquatic Health Monitoring Protocol. The Protocol describes the locations, timing, frequency and methods employed during sampling, as well as the methods used to analyze sampling data. The Reference Condition Approach (RCA) is the method chosen for assessing the health of freshwater ecosystems in the Yukon. One RCA model was developed for bioassessment based upon benthic macroinvertebrates, and a second model was developed to assess the diversity of fish species.

The RCA model for invertebrates relies upon 224 reference sites collected over the period 2004 to 2010 by the University of Western Ontario, Fisheries and Oceans Canada, and the Yukon government, using the same standard protocol. The invertebrate data set was analyzed at the family level.

There are two fundamental steps in the process of developing the predictive model. The first is to classify the reference sites based on their biological characteristics. This requires defining a number of community types based on the taxonomic composition. The second step is to determine a subset of habitat attributes that are associated with those community types. Following this step the number and type of organisms expected to occur at any given site can be determined from habitat attributes.

The first step resulted in five community groups being defined for reference sites in the Yukon River basin. There are 53 sites in Group 1, 56 sites in Group 2, 24 sites in Group 3, 91 sites in Group 4 and 13 sites in Group 5.

The following is a summary of the general characteristics of each group.

*Group 1: Sites have i*ntermediate relative abundance, with a community dominated by chironomids and they represent more than 60% of the community with Baetidae mayfly and Nemourid stoneflies as the other major families in the community. These sites have the lowest amount of alpine land cover in the catchments, but the greatest amount of forest cover. The sites have deeper stream channels and the substrate at these sites is largely embedded. This community is more typically found in the eastern part of the study area.

Group 2: These are sites of intermediate abundance and high taxonomic richness, this is a mayfly (Beatidae and Heptageniidea) dominated (>40%) community chironomids are less dominant (18%) and, stoneflies (Nomouridea) and Simuliidae are also abundant. These are streams in the SW Yukon with lower rainfall but higher snowfall, the catchments also have a higher percentage of alpine habitat in the catchment, they also tend to be higher altitude but January temperatures are milder. The substrate is the least embedded (less than 25%) and has the largest dominant particle size (5-10 cm).

Group 3: These sites represent a very depauperate community, with chironomids as the dominant group and the lowest overall family richness. These are more western sites, with lower snowfall, but higher rainfall, again they tend to have deeper channels. These sites have the smallest substrate (<2.5 cm). The site catchments have the lowest stream density.

Group 4: This is the most abundant community with 10 times more organisms per sample than communities 1 and 2. The community also has the greatest taxonomic richness. Chironomids are again the most common family (40%), however the Baetidae are also very common (>13%). These streams tend to be in the northwestern part of the Yukon. They have the highest June rainfall and the greatest stream density in their catchments.

Group 5: This community has the greatest number of organisms and is again dominated by chironomids (44%) but Baetid mayflies (24%) and simulids (black flies) are also abundant (14%). These sites have a substrate with larger particale size (5-10 cm) that is largely unembedded (<1/4). These sites are located in the northwestern part of the study area and have catchments dominated by alpine land cover and have the least amount of forested landcover. They have the coolest June temperatures and the least amount of January precipitation.

Data from the same 224 reference sites was used to develop the RCA model for fish. The fish bioassessment is of interest, yet it should be noted that far more weight is assigned to the results of the invertebrate assessment. Fish may be present or absent during any short-term sampling event, while invertebrates have comparatively limited mobility and range during their aquatic stage. For this reason the presence or absence of invertebrates is a much more reliable indicator of aquatic health.

Fifty sites were sampled under the aquatic health monitoring program in 2010. Not all the sites that were sampled in 2010 could be used in the Yukon River Basin RCA model, as some of these sites were sampled to support the development of models and authorizations for the Liard and Alsek River watersheds. Two of the sites were sampled as potential reference sites, and 13 were test sites. The new reference sites were chosen to improve the distribution of reference sites across the Yukon. The reference sites sampled in 2010 have been incorporated into an improved Yukon River Basin RCA model that will be applied to test sites sampled in 2011.

Of the test sites sampled in 2010, nine were new and four were re-assessments of sites that were sampled in previous years. The following table summarizes the test site results. Only results that differ from the mean of the group by at least one standard deviation have been considered in the analysis. More detailed information is found in the individual test site assessments, which are appended to this report.

REFERENCE CONDITION APPROACH (RCA) RESULTS FOR TEST SITES

Site Code (year of sampling)	Group (probability of belonging to group)	Watershed	Watercourse	RCA Model Results for Benthic macroinvertebrates	Reason for Benthic macroinvertebrate Results
YPS-078.1 (2006)	Group 2 (44.1%)	Klondike River	Hunker Creek	stressed	One family of aquatic invertebrates with a 67% probability of occurrence was found in numbers that greatly exceed the mean of the Group 2 reference sites.
YPS-078.2 (2008)	Group 2 (41.4%)	Klondike River	Hunker Creek	potentially stressed	One with a 99% probability of occurrence was found in numbers that exceed the mean of Group 2 reference sites, and one family with a 68% probability of occurrence was less abundant than the mean.
YPS-078.3 (2010)	Group 1 (63.0%)	Klondike River	Hunker Creek	stressed	Six families with a high probability of occurrence were found in numbers that exceed the mean of Group 1 reference sites.
YPS-081.1 (2006)	Group 2 (42.7%)	Klondike River	Bonanza Creek	potentially stressed	Two families with a high probability of occurrence were found in numbers that exceed the mean of Group 2 reference sites.
YPS-081.2 (2008)	Group 2 (41.2%)	Klondike River	Bonanza Creek	stressed	One family with a 99% probability of occurrence was found in numbers below the mean of Group 2 reference sites, and one family with a 63% probability of occurrence was more abundant than the mean.
YPS-081.3 (2010)	Group 1 (63.7%)	Klondike River	Bonanza Creek at Highway	stressed	Four families with a high probability of occurrence were found in numbers that exceed the mean of Group 1 reference sites, and two families with a probability over 50% were absent.
YPS-084		Klondike River	Bonanza Creek	stressed	Sampled in 2006 using the first model developed. The model has been revised a couple of times since 2006.
YPS-084.2 (2010)	Group 1 (62.1%)	Klondike River	Bonanza Creek	severely stressed	Nine families were significantly more abundant then expected, two of which were sensitive to disturbance, and on family with a probability over 50% was absent.

Site Code (year of sampling)	Group (probability of belonging to group)	Watershed	Watercourse	RCA Model Results for Benthic macroinvertebrates	Reason for Benthic macroinvertebrate Results
YPS-153 (2006)	Group 3 (43.3%)	Yukon River North	Henderson Creek	potentially stressed	There were two taxa with greater than 50% probability of occurrence which were absent, including *Chironomidae* which has a 96% probability of occurrence. Relative abundance was higher than the group means for three taxa. There was one taxa present that does not occur in the group.
YPS-153.2 (2009)	Group 3 (43.3%)	Yukon River North	Henderson Creek	unstressed	The total number of families and families with a high probability of occurrence were observed in numbers that fall within the mean of Group 3 reference sites.
YPS-153.3 (2010)	Group 3 (45.5%)	Yukon River North	Henderson Creek	unstressed	The total number of families The total number of families and families with a high probability of occurrence were observed in numbers that fall within the mean of Group 3 reference sites.
YPS-426	Group 4 (87.1%)	Stewart River	Valley Creek	stressed	Three families with a low probability of occurrence were found in numbers below the mean of Group 4 reference sites, one family present was not expected and three families with a 50% probability of occurrence were not found.
YPS-427	Group 4 (63.2%)	Stewart River	Rosebud Creek	Potentially stressed	Three families with a low probability of occurrence were found in numbers below the mean of Group 4 reference sites, one family present was not expected and two families with a 50% probability of occurrence were absent.
YPS-428	Group 4 (84.8%)	Stewart River	Black Hills Creek (mouth)	severely stressed	Two families with a low probability of occurrence were found in numbers below the mean of Group 4 reference sites and seven families with a 50% probability of occurrence were absent.
YPS-429	Group 4 (58.8%)	Stewart River	Black Hills Creek (Dome Creek Confluence)	potentially stressed	Six families with a relatively low probability of occurrence were found in numbers below the mean of Group 4 reference sites.

Site Code (year of sampling)	Group (probability of belonging to group)	Watershed	Watercourse	RCA Model Results for Benthic macroinvertebrates	Reason for Benthic macroinvertebrate Results
YPS-430	Group 4 (61.1%)	Stewart River	Maisy May Creek	potentially stressed	Six families with a relative low probability of occurrence were found in numbers below the mean of Group 4 reference sites, and two unexpected families were present.
YPS-431 Change with 75%	Group 4 (70.4%)	Stewart River	Scroggie Creek	potentially stressed	Five families were less abundant than expected. Two families with a probability of occurrence of 50% or greater were absent, one of which is sensitive to disturbance.
YPS-432	Group 4 (95.0%)	Stewart River	Barker Creek	Severely stressed	Five families with a low probability of occurrence were found in numbers below the mean of Group 4 reference sites and four families with 50% probability of occurrence were absent.
YPS-433 Changed with 75%	Group 4 (89.6%)	Stewart River	Brewer Creek	potentially stressed	Five families were less abundant than expected. One of these families is sensitive to disturbance. Four families with a probability of occurrence of 50% or greater were absent.
YPS-435	Group 3 (41.1%)	Stewart River	Clear Creek	potentially stressed	A significant number of families with a high probability of occurrence were found in numbers that exceed the mean of Group 3 reference sites, and two families with a probability over 50% were absent.

Note: YPS-078.3, YPS-081.3, YPS-84.2 were re-assessments of sites sampled in 2006 and YPS-153.3 was a re-assessment of a site sampled in 2006 and 2009.

Site Assessment Report

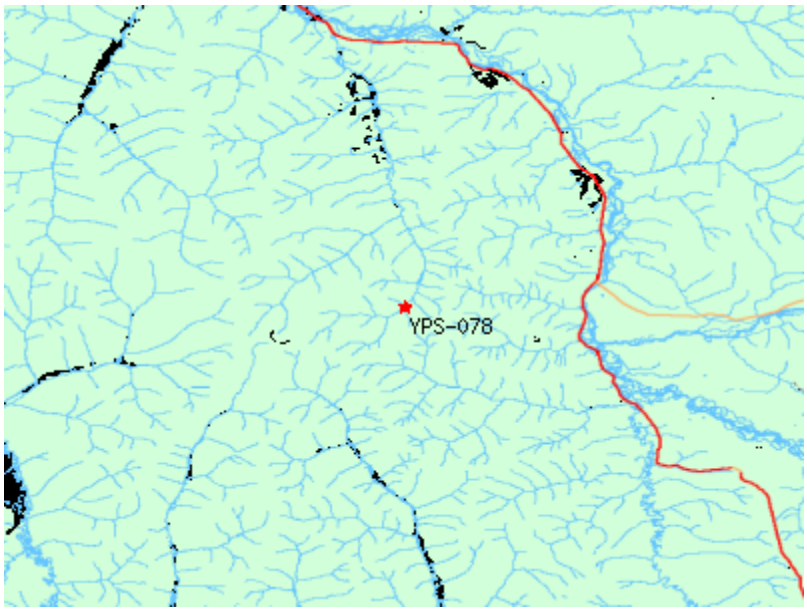
Site Metadata

Site	YPS-078.3
Sample Date	July 21, 2010
Latitude	N 63° 55' 21"
Longitude	W 138° 53' 2"
Altitude	1923
Feature Name	Hunker Creek upstream of Ontario Cr.
Stream Order	3

Site Photograph

Up Stream

Context Map



BEAST Prediction Results

Predictor Variables	Altitude,Landcover - Alpine,Landcover - Forest,Landcover - Unregen Forest,Landcover - Wetland,Longitude,Precip Rainfall JAN (mm),Precip Snowfall JUN (mm),Stream density (m stream/km2 catchment),Temp Max JAN (deg C)
Predicted Group Number	1

Group	1	2	3	4	5
Probability	63.0%	14.3%	16.4%	6.0%	0.3%

Habitat Attributes

Variable	Site	Reference Group Mean	Standard Deviation	Sample Size
Bedrock Geology - Intrusive (%)	0	0	0	50
Bedrock Geology - Metamorphic (%)	0	8.004	27.404	50
Bedrock Geology - Sedimentary (%)	100	66.587	45.756	50
Bedrock Geology - Sedimentary/Volcanic (%)		3.296	12.458	50
Bedrock Geology - Ultramafic (%)	0	0.282	1.466	50
Bedrock Geology - Ultramafic/Metamorphic (%)	0			50
Bedrock Geology - Unconsolidated (%)		13.433	33.661	50
Bedrock Geology - Volcanic (%)	0	4	19.795	50
Canopy - % coverage (PercentRange)	3			50
Carbon - dissolved organic (DOC) (mg/L)	10.2			50
Channel Depth - avg (cm)	6	40.925	38.368	50
Channel Depth - max (cm)	12			50
Direct Velocity Measuremen Instrument (Category (1-3))	3			50
Drainage Area (km^2)	20	114.927	213	50
General - Conductivity (uS/cm)	358	252.04	149.405	50
General - dissolved oxygen (DO) (mg/L)	10.72			50
General - pH (pH)	8.1	7.552	0.841	50
General - Specific Conductance (@ 25 C) (uS/cm)	534			50
General - Turbidity (NTU)	4.33			50
Habitats - pools (Binary)	0			50
Habitats - rapids (Binary)	0			50
Habitats - riffles (Binary)	1			50
Habitats - straight run (Binary)	1			50
Hg (ppm)	10			50
Hg (ng/L)	10			50
Landcover - Alpine (%)	0	16.082	27.163	50
Landcover - Forest (%)	100	38.959	35.785	50
Landcover - Lake (%)	0	0.849	2.829	50
Landcover - Nonprod Forest (%)	0	26.423	29.167	50
Landcover - River (%)	0			50
Landcover - Unregen Forest (%)	0	5.879	12.171	50
Landcover - Urban (%)	0			50
Landcover - Wetland (%)	0	1.862	4.517	50
Macrophyte (PercentRange)	0			50
Nitrogen - ammonia (mg/L)	0.001			50
Nitrogen - nitrate + nitrite (mg/L)	0.07			50
Nitrogen - nitrite (mg/L)	0.001			50

Perimeter - upstream drainage area (Km)	24.4	59.009	60.929	50
Phosphorus - total (mg/L)	0.002			50
Precip Rainfall JAN (mm) (mm)	0.3	0.2	0.382	50
Precip Rainfall JUN (mm) (mm)	42.7	36.244	6.404	50
Precip Rainfall Total ANNUAL (mm) (mm)	200.7	183.194	29.197	50
Precip Snowfall JAN (mm) (mm)	22	20.708	5.462	50
Precip Snowfall JUN (mm) (mm)	0	0.286	0.457	50
Precip Snowfall Total ANNUAL (mm) (mm)	156.9	127.7	20.326	50
Precip Total ANNUAL (mm) (mm)	395.3	304.782	41.797	50
Precip Total JAN (mm) (mm)	20.3	19.446	5.427	50
Precip Total JUN (mm) (mm)	42.5	36.684	6.531	50
Riparian - coniferous trees (Binary)	1			50
Riparian - deciduous trees (Binary)	1			50
Riparian - grasses/ferns (Binary)	1			50
Riparian - shrubs (Binary)	1			50
Slope (m/m)	0.02			50
Solids - Total Dissolved (TDS filterable residue) (mg/L)	408			50
Solids - total suspended (TSS) (mg/L)	2.5			50
Stream density (m stream/km2 catchment) (m/km^2)	283.39	306.999	78.344	50
Stream length (m) in catchment (m)	5808	36698.5	74087.69	50
Substrate - 2nd dominant size category (Category(0-9))	5			50
Substrate - dominant size category (Category(0-9))	1	4.94	1.942	50
Substrate - embeddedness category (Category(1-5))	4	3.66	1.118	50
Substrate - surrounding material size category (Category(0-9))	1			50
Temp Max JAN (deg C) (Degrees Celsius)	-21.8	-20.26	3.969	50
Temp Max JUN (deg C) (Degrees Celsius)	20.9	18.956	1.461	50
Temp Mean JAN (deg C) (Degrees Celsius)	-26.4	-25.346	3.962	50
Temp Mean JUN (deg C) (Degrees Celsius)	13.8	11.934	1.133	50
Temp Min JAN(deg C) (Degrees Celsius)	-31	-30.954	4.102	50
Temp Min JUN (deg C) (Degrees Celsius)	6.8	4.812	0.952	50
Temperature - air (Degrees Celsius)	22			50
Temperature - lake surface or stream (Degrees Celsius)	7.75			50
Velocity (Avg) (m/s)	0.36	0.38	0.251	50
Velocity (Max) (m/s)	0.75			50
Velocity Measurement Method (Category (1-3))	3			50
Width - Bankfull (m)	3.8			50
Width - Wetted (m)	2.3	4.904	3.485	50

Bray-Curtis Analysis

Description	Value
Bray-Curtis Distance	0.73
Bray Curtis Reference Median	331.5

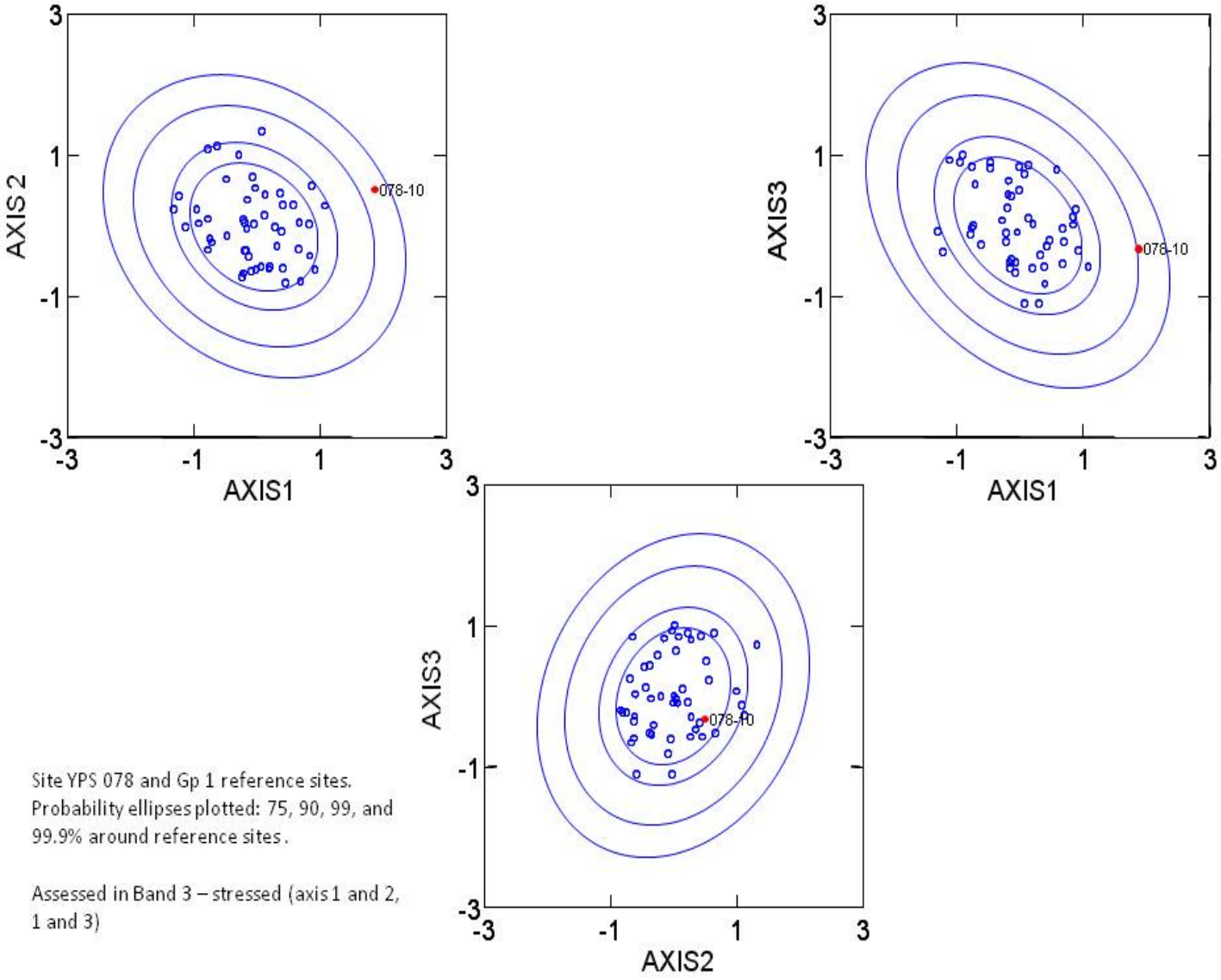
RIVPACS Analysis

Taxa	Probability of Occurrence	2010 Total Abundance	Mean of Abundance for Reference sites in Group 1	SD of Abundance for Reference sites in Group 1	Benthic Invertebrate Taxa Tolerance	
Chironomidae	0.99	466	139.8	60.373	6	Insensitive
Simuliidae	0.73	3	11.76	16.581	6	Insensitive
Baetidae	0.71	74	20.06	29.551	4	Insensitive
Nemouridae	0.66	11	13.2	24.083	2	Sensitive
Heptageniidae	0.49	66	6.5	13.406	4	Insensitive
Tipulidae	0.46	17	2.02	3.08	3	Insensitive
Limnephilidae	0.43	6	2.36	4.525	4	Insensitive
Sperchonidae	0.42	-	2.16	3.553	8	Tolerant
Naididae	0.37	11	7.22	12.425	10	Tolerant
Empididae	0.34	189	1.4	2.74	6	Insensitive
Chloroperlidae	0.33	-	2.4	6.443	1	Sensitive
Ameletidae	0.27	14	0.7	1.515	0	Sensitive
Ephemerellidae	0.27	-	2.34	7.372	1	Sensitive
Lumbriculidae	0.27	17	2.92	6.639	8	Tolerant
Capniidae	0.24	9	2.96	7.538	1	Sensitive
Rhyacophilidae	0.24	6	0.86	2.532	0	Sensitive
Ceratopogonidae	0.23	-	0.94	3.835	6	Insensitive
Perlodidae	0.2	-	0.48	1.403	2	Sensitive
Lebertiidae	0.19	-	0.58	2.417	8	Tolerant
Psychodidae	0.17	20	0.36	1.064	10	Tolerant
Dytiscidae	0.16	-	0.62	1.627	5	Insensitive
Brachycentridae	0.12	-	0.44	1.343	1	Sensitive
Lymnaeidae	0.1	-	0.32	1.077	6	Insensitive
Pisidiidae	0.1	-	0.88	3.456	8	Tolerant
Corixidae	0.08	-	0.16	0.618		
Glossosomatidae	0.08	-	0.5	2.667	0	Sensitive
Leuctridae	0.08	-	0.28	1.161	0	Sensitive
Valvatidae	0.08	-	1.1	4.258	8	Tolerant
Hydropsychidae	0.07	-	0.16	0.889	4	Insensitive
Hydroptilidae	0.07	-	0.26	1.139	4	Insensitive
Leptophlebiidae	0.07	-	0.12	0.48	2	Sensitive
Planorbidae	0.07	-	0.64	4.241	7	Tolerant
Dixidae	0.06	-	0.1	0.364	1	Sensitive
Muscidae	0.05	-	0.1	0.416	6	Insensitive
Elmidae	0.04	-	0.26	1.7	4	Insensitive
Gammaridae	0.04	-	0.08	0.444	4	Insensitive
Hyalellidae	0.04	-	0.06	0.314	8	Tolerant
Hydrozetidae	0.04	3	0.04	0.283		
Uenoidae	0.04	-	0.06	0.424	0	Sensitive
Deuterophlebiidae	0.03	-	0.02	0.141	0	Sensitive
Hydrobiidae	0.03	-	0.12	0.849	8	Tolerant
Hygrobatidae	0.03	-	0	0	8	Tolerant
Curculionidae	0.02	-	0.02	0.141		
Limnesiidae	0.02	-	0.04	0.283		

Peltoperlidae	0.02	-	0.02	0.141	2	Sensitive
Physidae	0.02	-	0.06	0.424	8	Tolerant
Scathophagidae	0.02	-	0.02	0.141		
Tubificidae	0.02	-	0	0	10	Tolerant
Athericidae	0.01	-	0.02	0.141		
Caenidae	0.01	-	0.04	0.283	7	Tolerant
Culicidae	0.01	-	0	0	8	Tolerant
Glossiphoniidae	0.01	-	0.02	0.141	8	Tolerant
Hydraenidae	0.01	-	0.02	0.141	5	Insensitive
Hydrophilidae	0.01	-	0	0	5	Insensitive
Lepidostomatidae	0.01	-	0	0	3	Insensitive
Leptoceridae	0.01	-	0.06	0.424	4	Insensitive
Metretopodidae	0.01	-	0.24	1.697		
Perlidae	0.01	-	0	0	1	Sensitive
Planariidae	0.01	-	0	0	1	Sensitive
Sminthuridae	0.01	-	0	0	10	Tolerant
Apataniidae	0	-	0	0	1	Sensitive
Isotomidae			0.06	0.424		

Note: All the organisms' with a probability of .05 or lower are not included on this list, if all the columns had zeros in them.

Site Assessment Graphs



Site YPS 078 and Gp 1 reference sites.
Probability ellipses plotted: 75, 90, 99, and 99.9% around reference sites.

Assessed in Band 3 – stressed (axis 1 and 2, 1 and 3)

Site Assessment Vector Data

Assessment For The Test Site	
Vector 1 Vs Vector 2	Stressed
Vector 1 Vs Vector 3	Stressed
Vector 2 Vs Vector 3	Unstressed
Overall	Stressed

Site Metrics

Metric Name	Test Site	Reference Group Mean	Standard Deviation	Sample Size
Total Abundance	**911.30**	**227.96**	**96.92**	**50**
Total No. of Taxa	**15**	**9.78**	**4.117**	**50**

Site Assessment Report

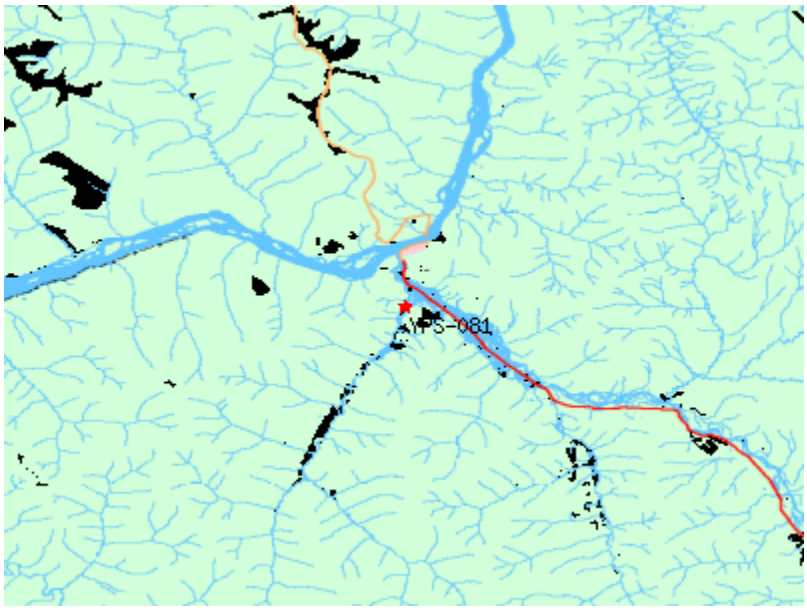
Site Metadata

Site	YPS-081.3
Sample Date	July 21, 2010
Latitude	N 64° 1' 50"
Longitude	W 139° 23' 19"
Altitude	1130
Feature Name	Bonanza Creek at Highway
Stream Order	3

Site Photograph

Up Stream

Context Map



BEAST Prediction Results

Predictor Variables	Altitude,Landcover - Alpine,Landcover - Forest,Landcover - Unregen Forest,Landcover - Wetland,Longitude,Precip Rainfall JAN (mm),Precip Snowfall JUN (mm),Stream density (m stream/km2 catchment),Temp Max JAN (deg C)
Predicted Group Number	1

Group	1	2	3	4	5
Probability	63.7%	15.5%	17.3%	3.3%	0.1%

Habitat Attributes

Variable	Site	Reference Group Mean	Standard Deviation	Sample Size
Bedrock Geology - Intrusive (%)	0	0	0	50
Bedrock Geology - Metamorphic (%)	99.95	8.004	27.404	50
Bedrock Geology - Sedimentary (%)	0.05	66.587	45.756	50
Bedrock Geology - Sedimentary/Volcanic (%)	0	3.296	12.458	50
Bedrock Geology - Ultramafic (%)	0	0.282	1.466	50
Bedrock Geology - Ultramafic/Metamorphic (%)	0			50
Bedrock Geology - Unconsolidated (%)	0	13.433	33.661	50
Bedrock Geology - Volcanic (%)	0	4	19.795	50
Canopy - % coverage (PercentRange)	1			50
Carbon - dissolved organic (DOC) (mg/L)	13			50
Channel Depth - avg (cm)	18.6	40.925	38.368	50
Channel Depth - max (cm)	23			50
Cl (mg/L)	1.5			50
Direct Velocity Measuremen Instrument (Category (1-3))	3			50
Drainage Area (km^2)	242.26	114.927	213	50
General - Conductivity (uS/cm)	450	252.04	149.405	50
General - dissolved oxygen (DO) (mg/L)	10.2			50
General - pH (pH)	8.3	7.552	0.841	50
General - Specific Conductance (@ 25 C) (uS/cm)	583			50
General - Turbidity (NTU)	8.16			50
Habitats - pools (Binary)	1			50
Habitats - rapids (Binary)	0			50
Habitats - riffles (Binary)	1			50
Habitats - straight run (Binary)	1			50
Hg (ppm)	0.01			50
Hg (ng/L)	0.01			50
Landcover - Alpine (%)	0.74	16.082	27.163	50
Landcover - Forest (%)	94.32	38.959	35.785	50
Landcover - Lake (%)	0	0.849	2.829	50
Landcover - Nonprod Forest (%)	1.16	26.423	29.167	50
Landcover - River (%)	0			50
Landcover - Unregen Forest (%)	0	5.879	12.171	50
Landcover - Urban (%)	3.38			50
Landcover - Wetland (%)	0.41	1.862	4.517	50
Macrophyte (PercentRange)	0			50
Nitrogen - ammonia (mg/L)	0.002			50
Nitrogen - nitrate + nitrite (mg/L)	0.001			50

Nitrogen - nitrite (mg/L)	0.001			50
Perimeter - upstream drainage area (Km)	101.9	59.009	60.929	50
Phosphorus - total (mg/L)	0.009			50
Precip Rainfall JAN (mm) (mm)	0.3	0.2	0.382	50
Precip Rainfall JUN (mm) (mm)	42.7	36.244	6.404	50
Precip Rainfall Total ANNUAL (mm) (mm)	200.7	183.194	29.197	50
Precip Snowfall JAN (mm) (mm)	22	20.708	5.462	50
Precip Snowfall JUN (mm) (mm)	0	0.286	0.457	50
Precip Snowfall Total ANNUAL (mm) (mm)	156.9	127.7	20.326	50
Precip Total ANNUAL (mm) (mm)	346.2	304.782	41.797	50
Precip Total JAN (mm) (mm)	20.3	19.446	5.427	50
Precip Total JUN (mm) (mm)	42.5	36.684	6.531	50
Riparian - coniferous trees (Binary)	1			50
Riparian - deciduous trees (Binary)	1			50
Riparian - grasses/ferns (Binary)	1			50
Riparian - shrubs (Binary)	1			50
Slope (m/m)				50
Solids - Total Dissolved (TDS filterable residue) (mg/L)	464			50
Solids - total suspended (TSS) (mg/L)	6.9			50
Stream density (m stream/km2 catchment) (m/km^2)	841.2	306.999	78.344	50
Stream length (m) in catchment (m)	203785	36698.5	74087.7	50
Substrate - 2nd dominant size category (Category(0-9))	3			50
Substrate - dominant size category (Category(0-9))	5	4.94	1.942	50
Substrate - embeddedness category (Category(1-5))	5	3.66	1.118	50
Substrate - surrounding material size category (Category(0-9))	2			50
Temp Max JAN (deg C) (Degrees Celsius)	-21.8	-20.26	3.969	50
Temp Max JUN (deg C) (Degrees Celsius)	20.9	18.956	1.461	50
Temp Mean JAN (deg C) (Degrees Celsius)	-26.4	-25.346	3.962	50
Temp Mean JUN (deg C) (Degrees Celsius)	13.8	11.934	1.133	50
Temp Min JAN(deg C) (Degrees Celsius)	-31	-30.954	4.102	50
Temp Min JUN (deg C) (Degrees Celsius)	6.8	4.812	0.952	50
Temperature - air (Degrees Celsius)	21			50
Temperature - lake surface or stream (Degrees Celsius)	13.46			50
Velocity (Avg) (m/s)	0.48	0.38	0.251	50
Velocity (Max) (m/s)	0.78			50
Velocity Measurement Method (Category (1-3))	3			50
Width - Bankfull (m)	19.6			50
Width - Wetted (m)	4.3	4.904	3.485	50

Bray-Curtis Analysis

Description	Value
Bray-Curtis Distance	0.9
Bray Curtis Reference Median	331.5

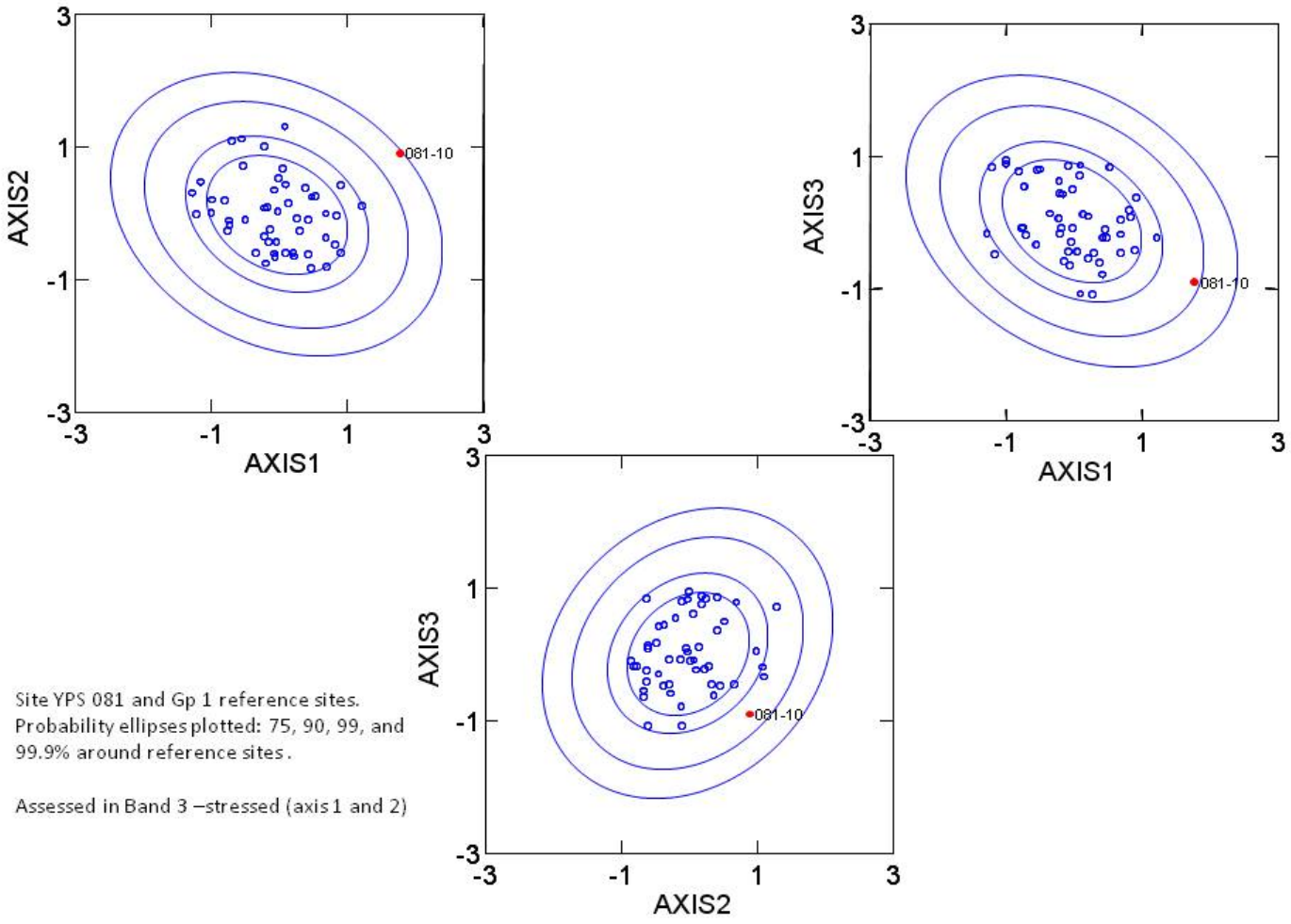
RIVPACS Analysis

Taxa	Probability Of Occurrence	2010 Total Abundance	Mean of Abundance for Reference sites in Group 1	SD of Abundance for Reference sites in Group 1	Benthic Invertebrate Taxa Tolerance	
Ameletidae	0.26	-	0.7	1.515	0	Sensitive
Apataniidae	0	-	0	0	1	Sensitive
Athericidae	0.01	-	0.02	0.141		
Baetidae	0.71	696	20.06	29.551	4	Insensitive
Brachycentridae	0.12	135	0.44	1.343	1	Sensitive
Caenidae	0.01	-	0.04	0.283	7	Tolerant
Capniidae	0.23	-	2.96	7.538	1	Sensitive
Ceratopogonidae	0.23	-	0.94	3.835	6	Insensitive
Chironomidae	0.98	348	139.8	60.373	6	Insensitive
Chloroperlidae	0.33	-	2.4	6.443	1	Sensitive
Corixidae	0.09	-	0.16	0.618		
Culicidae	0.02	-	0	0	8	Tolerant
Curculionidae	0.02	-	0.02	0.141		
Deuterophlebiidae	0.03	-	0.02	0.141	0	Sensitive
Dixidae	0.06	-	0.1	0.364	1	Sensitive
Dytiscidae	0.16	-	0.62	1.627	5	Insensitive
Elmidae	0.04	-	0.26	1.7	4	Insensitive
Empididae	0.33	35	1.4	2.74	6	Insensitive
Ephemerellidae	0.27	4	2.34	7.372	1	Sensitive
Gammaridae	0.04	-	0.08	0.444	4	Insensitive
Glossiphoniidae	0.01	-	0.02	0.141	8	Tolerant
Glossosomatidae	0.08	-	0.5	2.667	0	Sensitive
Heptageniidae	0.48	-	6.5	13.406	4	Insensitive
Hyalellidae	0.04	-	0.06	0.314	8	Tolerant
Hydraenidae	0.01	-	0.02	0.141	5	Insensitive
Hydrobiidae	0.03	-	0.12	0.849	8	Tolerant
Hydrophilidae	0.01	-	0	0	5	Insensitive
Hydropsychidae	0.07	-	0.16	0.889	4	Insensitive
Hydroptilidae	0.07	-	0.26	1.139	4	Insensitive
Hydrozetidae	0.03	-	0.04	0.283		
Hydryphantidae	0.01	-	0	0		
Hygrobatidae	0.03	4	0	0	8	Tolerant
Isotomidae			0.06	0.424		
Lebertiidae	0.18	17	0.58	2.417	8	Tolerant
Lepidostomatidae	0.01	-	0	0	3	Insensitive
Leptoceridae	0.01	-	0.06	0.424	4	Insensitive
Leptophlebiidae	0.07	-	0.12	0.48	2	Sensitive
Leuctridae	0.08	-	0.28	1.161	0	Sensitive
Limnephilidae	0.42	9	2.36	4.525	4	Insensitive
Limnesiidae	0.02	-	0.04	0.283		
Lumbriculidae	0.27	70	2.92	6.639	8	Tolerant
Lymnaeidae	0.1	-	0.32	1.077	6	Insensitive
Metretopodidae	0.01	-	0.24	1.697		

Muscidae	0.05	-	0.1	0.416	6	Insensitive
Naididae	0.38	-	7.22	12.425	10	Tolerant
Nemouridae	0.65	13	13.2	24.083	2	Sensitive
Peltoperlidae	0.02	-	0.02	0.141	2	Sensitive
Perlidae	0.01	-	0	0	1	Sensitive
Perlodidae	0.2	4	0.48	1.403	2	Sensitive
Phryganeidae	0	-	0	0	4	Insensitive
Physidae	0.02	-	0.06	0.424	8	Tolerant
Pisidiidae	0.1	-	0.88	3.456	8	Tolerant
Planariidae	0.01	-	0	0	1	Sensitive
Planorbidae	0.07	-	0.64	4.241	7	Tolerant
Psychodidae	0.17	-	0.36	1.064	10	Tolerant
Rhyacophilidae	0.24	-	0.86	2.532	0	Sensitive
Scathophagidae	0.02	-	0.02	0.141		
Simuliidae	0.72	-	11.76	16.581	6	Insensitive
Sminthuridae	0.01	-	0	0	10	Tolerant
Sperchonidae	0.41	-	2.16	3.553	8	Tolerant
Taeniopterygidae	0	-	0	0	2	Sensitive
Tipulidae	0.45	96	2.02	3.08	3	Insensitive
Tubificidae	0.02	-	0	0	10	Tolerant
Uenoidae	0.04	-	0.06	0.424	0	Sensitive
Valvatidae	0.08	-	1.1	4.258	8	Tolerant

Note: All the organisms' with a probability of .05 or lower are not included on this list, if all the columns had zeros in them.

Site Assessment Graphs



Site Assessment Vector Data

Assessment For The Test Site	
Vector 1 Vs Vector 2	Stressed
Vector 1 Vs Vector 3	Potentially Stressed
Vector 2 Vs Vector 3	Potentially Stressed
Overall	Stressed

Site Metrics

Metric Name	Test Site	Reference Group Mean	Standard Deviation	Sample Size
Total Abundance	**1430.32**	**227.96**	**96.92**	**50**
Total No. of Taxa	**12**	**9.78**	**4.117**	**50**

Site Assessment Report

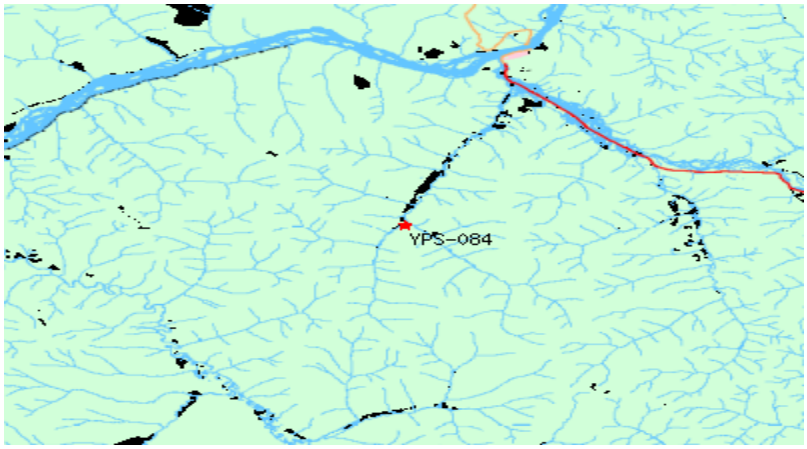
Site Metadata

Site	YPS-084.2
Sample Date	July 21, 2010
Latitude	N 63° 55' 6"
Longitude	W 139° 18' 50"
Altitude	1677
Feature Name	Bonanza Creek upstream of Eldorado inflow
Stream Order	2

Site Photograph

Up Stream

Context Map



BEAST Prediction Results

Predictor Variables	Altitude,Landcover - Alpine,Landcover - Forest,Landcover - Unregen Forest,Landcover - Wetland,Longitude,Precip Rainfall JAN (mm),Precip Snowfall JUN (mm),Stream density (m stream/km2 catchment),Temp Max JAN (deg C)				
Predicted Group Number	1				
Group	**1**	**2**	**3**	**4**	**5**
Probability	62.1%	14.5%	18.9%	4.3%	0.2%

Habitat Attributes

Variable	Site	Reference Group Mean	Standard Deviation	Sample Size
Bedrock Geology - Intrusive (%)	0	0	0	50
Bedrock Geology - Metamorphic (%)	0	8.004	27.404	50
Bedrock Geology - Sedimentary (%)	99.85	66.587	45.756	50
Bedrock Geology - Sedimentary/Volcanic (%)	0.15	3.296	12.458	50
Bedrock Geology - Ultramafic (%)	0	0.282	1.466	50
Bedrock Geology - Ultramafic/Metamorphic (%)	0			50
Bedrock Geology - Unclassified (%)	0			50
Bedrock Geology - Unconsolidated (%)	0	13.433	33.661	50
Bedrock Geology - Volcanic (%)	0	4	19.795	50
Canopy - % coverage (PercentRange)	2			50
Carbon - dissolved organic (DOC) (mg/L)	6.3			50
Channel Depth - avg (cm)	18	40.925	38.368	50
Channel Depth - max (cm)	30			50
Cl (mg/L)	0.7			50
Direct Velocity Measuremen Instrument (Category (1-3))	3			50
Drainage Area (km^2)	80	114.927	213	50
General - Conductivity (uS/cm)	354	252.04	149.405	50
General - dissolved oxygen (DO) (mg/L)	4.72			50
General - pH (pH)	7.9	7.552	0.841	50
General - Specific Conductance (@ 25 C) (uS/cm)	467			50
General - Turbidity (NTU)	1.77			50
Habitats - pools (Binary)	1			50
Habitats - rapids (Binary)	0			50
Habitats - riffles (Binary)	1			50
Habitats - straight run (Binary)	1			50
Hg (ppm)	0.01			50
Hg (ng/L)	0.01			50
Landcover - Alpine (%)	2.28	16.082	27.163	50
Landcover - Forest (%)	94.13	38.959	35.785	50
Landcover - Lake (%)	0	0.849	2.829	50
Landcover - Nonprod Forest (%)	0.91	26.423	29.167	50
Landcover - River (%)	0			50
Landcover - Unregen Forest (%)	0	5.879	12.171	50
Landcover - Urban (%)	1.45			50
Landcover - Wetland (%)	1.24	1.862	4.517	50
Macrophyte (PercentRange)	0			50
Nitrogen - ammonia (mg/L)	0.002			50
Nitrogen - nitrate + nitrite (mg/L)	0.021			50
Nitrogen - nitrite (mg/L)	0.001			50
Perimeter - upstream drainage area (Km)	52.4	59.009	60.929	50
Phosphorus - total (mg/L)	0.006			50
Precip Rainfall JAN (mm) (mm)	0.3	0.2	0.382	50
Precip Rainfall JUN (mm) (mm)	42.7	36.244	6.404	50
Precip Rainfall Total ANNUAL (mm) (mm)	200.7	183.194	29.197	50

Precip Snowfall JAN (mm) (mm)	22	20.708	5.462	50
Precip Snowfall JUN (mm) (mm)	0	0.286	0.457	50
Precip Snowfall Total ANNUAL (mm) (mm)	156.9	127.7	20.326	50
Precip Total ANNUAL (mm) (mm)	346.2	304.782	41.797	50
Precip Total JAN (mm) (mm)	20.3	19.446	5.427	50
Precip Total JUN (mm) (mm)	42.5	36.684	6.531	50
Riparian - coniferous trees (Binary)	1			50
Riparian - deciduous trees (Binary)	1			50
Riparian - grasses/ferns (Binary)	1			50
Riparian - shrubs (Binary)	1			50
Slope (m/m)	0.01			50
SO4 (mg/L)	103			50
Solids - Total Dissolved (TDS filterable residue) (mg/L)	352			50
Solids - total suspended (TSS) (mg/L)	2.5			50
Stream density (m stream/km2 catchment) (m/km^2)	282.12	306.999	78.344	50
Stream length (m) in catchment (m)	22645	36698.5	74087.7	50
Substrate - 2nd dominant size category (Category(0-9))	7			50
Substrate - dominant size category (Category(0-9))	5	4.94	1.942	50
Substrate - embeddedness category (Category(1-5))	3	3.66	1.118	50
Substrate - surrounding material size category (Category(0-9))	1			50
Temp Max JAN (deg C) (Degrees Celsius)	-21.8	-20.26	3.969	50
Temp Max JUN (deg C) (Degrees Celsius)	20.9	18.956	1.461	50
Temp Mean JAN (deg C) (Degrees Celsius)	-26.4	-25.346	3.962	50
Temp Mean JUN (deg C) (Degrees Celsius)	13.8	11.934	1.133	50
Temp Min JAN(deg C) (Degrees Celsius)	-31	-30.954	4.102	50
Temp Min JUN (deg C) (Degrees Celsius)	6.8	4.812	0.952	50
Temperature - air (Degrees Celsius)	18			50
Temperature - lake surface or stream (Degrees Celsius)	12.49			50
Velocity (Avg) (m/s)	0.05	0.38	0.251	50
Velocity (Max) (m/s)	0.16			50
Velocity Measurement Method (Category (1-3))	3			50
Width - Bankfull (m)	7.1			50
Width - Wetted (m)	4.3	4.904	3.485	50

Bray-Curtis Analysis

Description	Value
Bray-Curtis Distance	0.96
Bray Curtis Reference Median	331.5

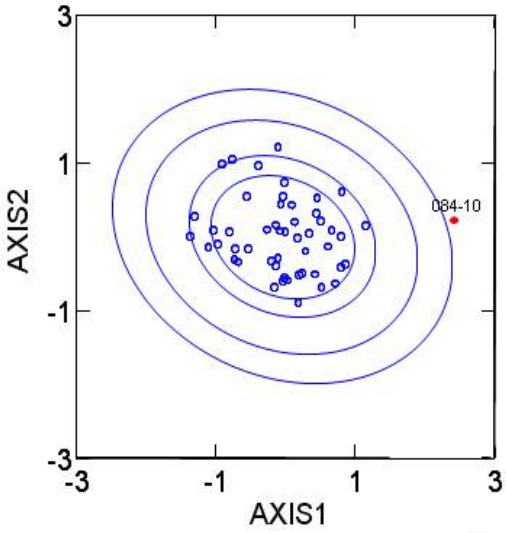
RIVPACS Analysis

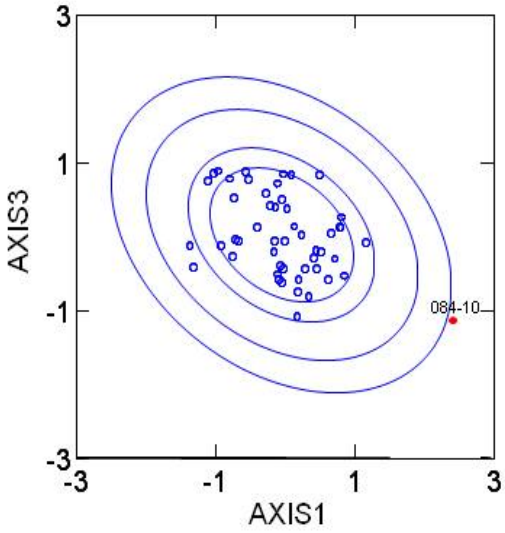
Taxa	Probability of Occurrence	2010 Total Abundance	Mean of Abundance for Reference sites in Group 1	SD of Abundance for Reference sites in Group 1	Benthic Invertebrate Taxa Tolerance	
Ameletidae	0.26	-	0.7	1.515	0	Sensitive
Apataniidae	0	-	0	0	1	Sensitive
Athericidae	0.01	-	0.02	0.141		
Baetidae	0.7	733	20.06	29.551	4	Insensitive
Brachycentridae	0.12	7	0.44	1.343	1	Sensitive
Caenidae	0.01	-	0.04	0.283	7	Tolerant
Capniidae	0.23	-	2.96	7.538	1	Sensitive
Ceratopogonidae	0.23	-	0.94	3.835	6	Insensitive
Chironomidae	0.98	1507	139.8	60.373	6	Insensitive
Chloroperlidae	0.32	-	2.4	6.443	1	Sensitive
Corixidae	0.08	-	0.16	0.618		
Culicidae	0.02	-	0	0	8	Tolerant
Curculionidae	0.02	-	0.02	0.141		
Deuterophlebiidae	0.03	-	0.02	0.141	0	Sensitive
Dixidae	0.06	-	0.1	0.364	1	Sensitive
Dytiscidae	0.16	27	0.62	1.627	5	Insensitive
Elmidae	0.04	-	0.26	1.7	4	Insensitive
Empididae	0.32	33	1.4	2.74	6	Insensitive
Ephemerellidae	0.27	-	2.34	7.372	1	Sensitive
Feltriidae	0.01	-	0	0		
Gammaridae	0.04	-	0.08	0.444	4	Insensitive
Glossiphoniidae	0.01	-	0.02	0.141	8	Tolerant
Glossosomatidae	0.08	-	0.5	2.667	0	Sensitive
Heptageniidae	0.47	-	6.5	13.406	4	Insensitive
Hyalellidae	0.03	-	0.06	0.314	8	Tolerant
Hydraenidae	0.01	-	0.02	0.141	5	Insensitive
Hydrobiidae	0.03	-	0.12	0.849	8	Tolerant
Hydrophilidae	0.01	-	0	0	5	Insensitive
Hydropsychidae	0.07	-	0.16	0.889	4	Insensitive
Hydroptilidae	0.07	-	0.26	1.139	4	Insensitive
Hydrozetidae	0.03	-	0.04	0.283		
Hydryphantidae	0.01	-	0	0		
Hygrobatidae	0.03	7	0	0	8	Tolerant
Isotomidae			0.06	0.424		
Lebertiidae	0.18	-	0.58	2.417	8	Tolerant
Lepidostomatidae	0.01	-	0	0	3	Insensitive
Leptoceridae	0.01	-	0.06	0.424	4	Insensitive
Leptophlebiidae	0.07	-	0.12	0.48	2	Sensitive
Leuctridae	0.08	-	0.28	1.161	0	Sensitive
Limnephilidae	0.42	7	2.36	4.525	4	Insensitive
Limnesiidae	0.02	-	0.04	0.283		
Lumbriculidae	0.27	60	2.92	6.639	8	Tolerant
Lymnaeidae	0.1	-	0.32	1.077	6	Insensitive

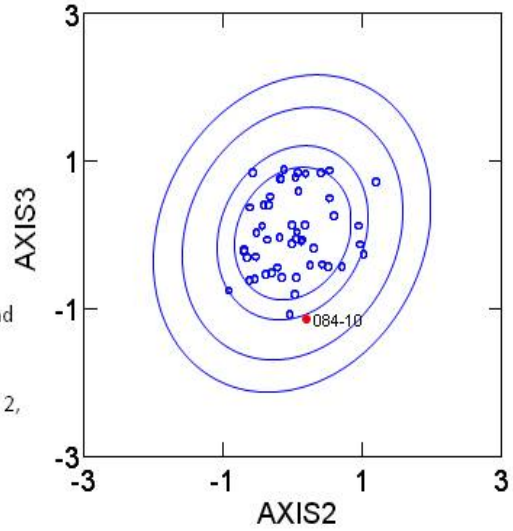
Metretopodidae	0.01	-	0.24	1.697		
Muscidae	0.05	7	0.1	0.416	6	Insensitive
Naididae	0.37	20	7.22	12.425	10	Tolerant
Nemouridae	0.65	7	13.2	24.083	2	Sensitive
Peltoperlidae	0.02	-	0.02	0.141	2	Sensitive
Perlidae	0.01	-	0	0	1	Sensitive
Perlodidae	0.2	7	0.48	1.403	2	Sensitive
Phryganeidae	0	-	0	0	4	Insensitive
Physidae	0.02	-	0.06	0.424	8	Tolerant
Pisidiidae	0.1	-	0.88	3.456	8	Tolerant
Planariidae	0.01	-	0	0	1	Sensitive
Planorbidae	0.07	-	0.64	4.241	7	Tolerant
Psychodidae	0.17	-	0.36	1.064	10	Tolerant
Rhyacophilidae	0.23	-	0.86	2.532	0	Sensitive
Scathophagidae	0.02	-	0.02	0.141		
Simuliidae	0.71	-	11.76	16.581	6	Insensitive
Sminthuridae	0.01	7	0	0	10	Tolerant
Sperchonidae	0.41	7	2.16	3.553	8	Tolerant
Taeniopterygidae	0	-	0	0	2	Sensitive
Tipulidae	0.45	127	2.02	3.08	3	Insensitive
Tubificidae	0.02	-	0	0	10	Tolerant
Uenoidae	0.04	-	0.06	0.424	0	Sensitive
Valvatidae	0.07	-	1.1	4.258	8	Tolerant

Note: All the organisms' with a probability of .05 or lower are not included on this list, if all the columns had zeros in them.

Site Assessment Graphs







Site YPS 084 and Gp 1 reference sites.
Probability ellipses plotted: 75, 90, 99, and 99.9% around reference sites.

Assessed in Band 4 – stressed (axis 1 and 2, 1 and 3)

Site Assessment Vector Data

Assessment For The Test Site	
Vector 1 Vs Vector 2	Severely Stressed
Vector 1 Vs Vector 3	Severely Stressed
Vector 2 Vs Vector 3	Potentially Stressed
Overall	Severely Stressed

Site Metrics

Metric Name	Test Site	Reference Group Mean	Standard Deviation	Sample Size
Total Abundance	**2559.88**	**227.96**	**96.92**	**50**
Total No. of Taxa	**15**	**9.78**	**4.117**	**50**

Site Assessment Report

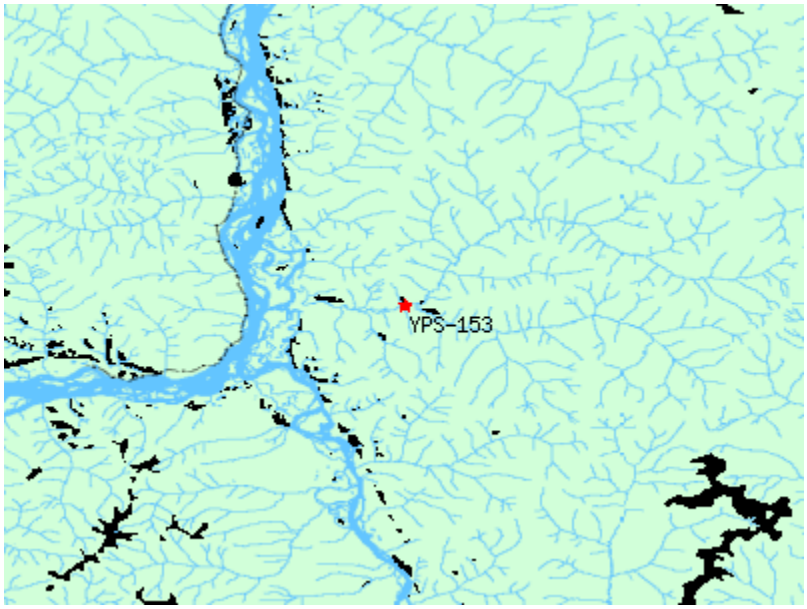
Site Metadata

Site	YPS-153.2
Sample Date	July 20 2010
Latitude	N 63° 22' 25"
Longitude	W 139° 20' 45"
Altitude	1264
Feature Name	Henderson Creek
Stream Order	5

Site Photograph

Up Stream

Context Map



BEAST Prediction Results

Predictor Variables	Altitude,Landcover - Alpine,Landcover - Forest,Landcover - Unregen Forest,Landcover - Wetland,Longitude,Precip Rainfall JAN (mm),Precip Snowfall JUN (mm),Stream density (m stream/km2 catchment),Temp Max JAN (deg C)
Predicted Group Number	3

Group	**1**	**2**	**3**	**4**	**5**
Probability	40.8%	11.1%	45.5	2.4%	0.2%

Habitat Attributes

Variable	Site	Reference Group Mean	Standard Deviation	Sample Size
Bedrock Geology - Intrusive (%)	0.00	10.29	0	22
Bedrock Geology - Metamorphic (%)	93.850	9.846	27.404	22
Bedrock Geology - Sedimentary (%)	0.900	65.213	45.756	22
Bedrock Geology - Ultramafic (%)	0.000	0.034	12.458	22
Bedrock Geology - Unconsolidated (%)	0.000	7.999	1.466	22
Bedrock Geology - Volcanic (%)	5.250	5.731		22
Canopy - % coverage (PercentRange)	2.00	1.48	33.661	22
Carbon - dissolved organic (DOC) (mg/L)	15.9000000	8.0901961	19.795	22
Channel Depth - avg (cm)	31.8	34.7		22
Channel Depth - max (cm)	42.0	33.6		22
Chloride - dissolved (mg/L)	0.3000000	0.2357143	38.368	22
Direct Velocity Measuremen Instrument (Category (1-3))	3	3		22
Drainage Area (km^2)	297.00	122.60		22
F (mg/L)	0.0900000	0.1152459		22
General - Conductivity (uS/cm)	104.0000000	220.1890244	213	22
General - dissolved oxygen (DO) (mg/L)	11.1000000	10.8975843	149.405	22
General - pH (pH)	8.0	7.7		22
General - Specific Conductance (@ 25 C) (uS/cm)	151.0000000	233.6285714	0.841	22
General - Turbidity (NTU)	20.9000000	91.8007792		22
Habitats - pools (Binary)	1	1		22
Habitats - rapids (Binary)	0	0		22
Habitats - riffles (Binary)	1	1		22
Habitats - straight run (Binary)	1	1		22
Landcover - Alpine (%)	0.180	27.299		22
Landcover - Forest (%)	65.170	25.213		22
Landcover - Lake (%)	0.000	0.595		22
Landcover - Nonprod Forest (%)	9.940	29.364	27.163	22
Landcover - River (%)	0.000	0.353	35.785	22
Landcover - Unregen Forest (%)	24.120	4.354	2.829	22
Landcover - Urban (%)	0.590	0.015	29.167	22
Landcover - Wetland (%)	0.000	1.438		22
Macrophyte (PercentRange)	1	0	12.171	22
Nitrogen - ammonia (mg/L)	0.0010000	0.0047679		22
Nitrogen - nitrate + nitrite (mg/L)	0.0470000	0.0708214	4.517	22
Nitrogen - nitrite (mg/L)	0.0020000	0.0052857		22
Perimeter - upstream drainage area (Km)	96.60	62.21		22

Phosphorus - total (mg/L)	0.0370000	0.1600268		22
Precip Rainfall JAN (mm) (mm)	0.300	0.233		22
Precip Rainfall JUN (mm) (mm)	42.700	37.419	60.929	22
Precip Rainfall Total ANNUAL (mm) (mm)	200.700	189.466		22
Precip Snowfall JAN (mm) (mm)	22.000	20.322	0.382	22
Precip Snowfall JUN (mm) (mm)	0.000	0.538	6.404	22
Precip Snowfall Total ANNUAL (mm) (mm)	156.900	132.508	29.197	22
Precip Total ANNUAL (mm) (mm)	346.200	312.900	5.462	22
Precip Total JAN (mm) (mm)	20.300	18.970	0.457	22
Precip Total JUN (mm) (mm)	42.500	38.293	20.326	22
Riparian - coniferous trees (Binary)	1	1	41.797	22
Riparian - deciduous trees (Binary)	1	1	5.427	22
Riparian - grasses/ferns (Binary)	1	1	6.531	22
Riparian - shrubs (Binary)	1	1		22
SO4 (mg/L)	26.0000000	31.8873874		22
Solids - Total Dissolved (TDS filterable residue) (mg/L)	143.0000000	136.2678571		22
Solids - total suspended (TSS) (mg/L)	41.0000000	64.9101639		22
Stream density (m stream/km2 catchment) (m/km^2)	295.60	365.13		22
Stream length (m) in catchment (m)	87928.00	42985.59		22
Substrate - 2nd dominant size category (Category(0-9))	7	5		22
Substrate - dominant size category (Category(0-9))	5	5	78.344	22
Substrate - embeddedness category (Category(1-5))	4	4	74087.7	22
Substrate - surrounding material size category (Category(0-9))	1	3		22
Temp Max JAN (deg C) (Degrees Celsius)	-21.800	-20.427	1.942	22
Temp Max JUN (deg C) (Degrees Celsius)	20.900	18.374	1.118	22
Temp Mean JAN (deg C) (Degrees Celsius)	-26.400	-25.376		22
Temp Mean JUN (deg C) (Degrees Celsius)	13.800	11.581	3.969	22
Temp Min JAN(deg C) (Degrees Celsius)	-31.000	-30.887	1.461	22
Temp Min JUN (deg C) (Degrees Celsius)	6.800	4.833	3.962	22
Temperature - air (Degrees Celsius)	21.0	17.7	1.133	22
Temperature - lake surface or stream (Degrees Celsius)	8.9800000	9.2979570	4.102	22
Velocity (Avg) (m/s)	0.50	0.53	0.952	22
Velocity (Max) (m/s)	0.75	0.80		22
Velocity Measurement Method (Category (1-3))	3	3		22
Width - Bankfull (m)	7.0	14.3	0.251	22
Width - Wetted (m)	7.0	6.2		22

Bray-Curtis Analysis

Description	Value
Bray-Curtis Distance	0.47
Bray Curtis Reference Median	274.5

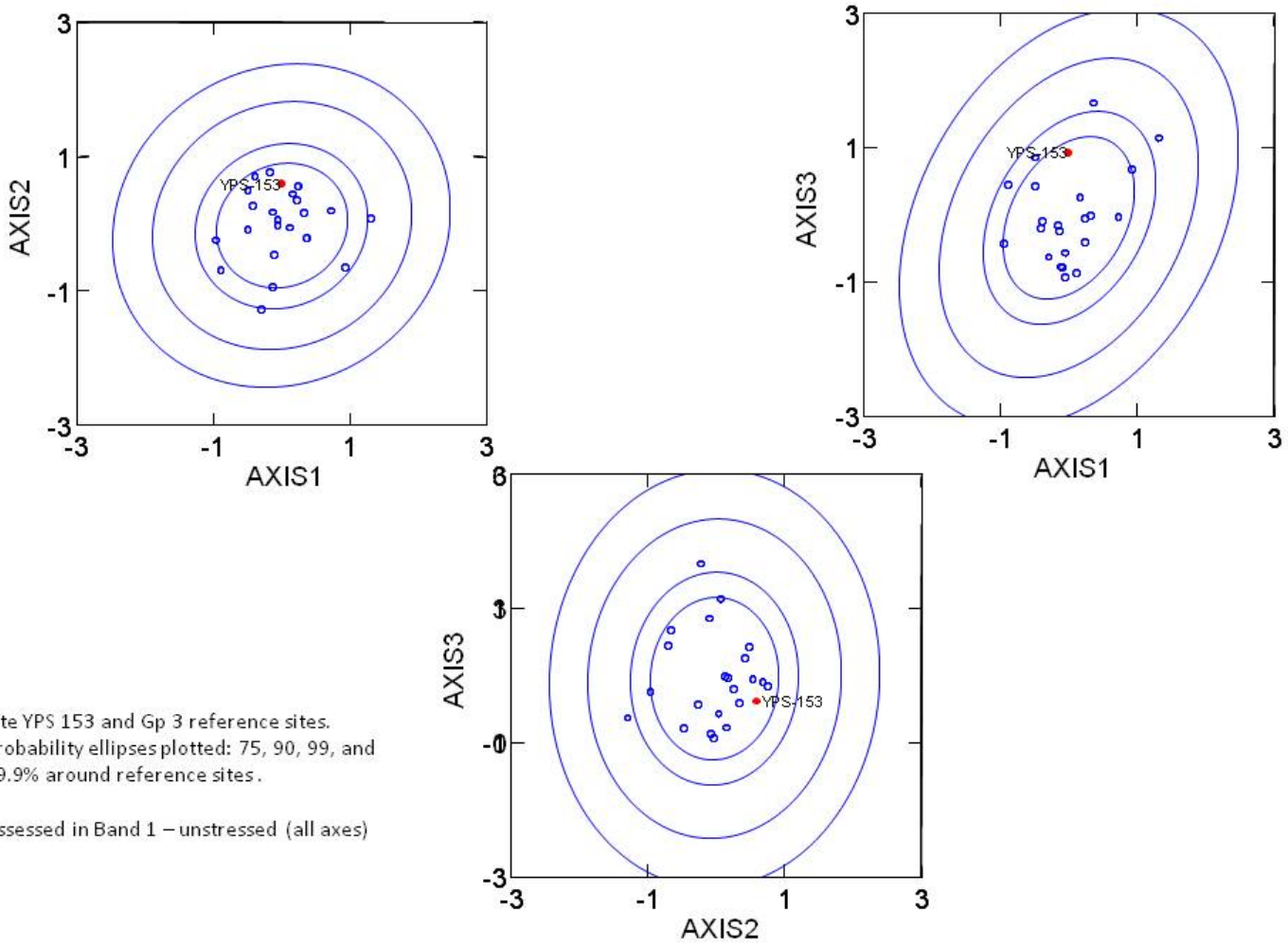
RIVPACS Analysis

Taxa	**Probability Of Occurrence**	2010 Total Abundance	Mean of Abundance for Reference sites in Group 3	SD of Abundance for Reference sites in Group 3	Benthic Invertebrate Taxa Tolerance	
Ameletidae	0.19	-	0.7	1.515	0	Sensitive
Athericidae	0.01	-	0.02	0.141		
Baetidae	0.59	64	20.06	29.551	4	Insensitive
Brachycentridae	0.10	-	0.44	1.343	1	Sensitive
Caenidae	0.01	-	0.04	0.283	7	Tolerant
Capniidae	0.18	9	2.96	7.538	1	Sensitive
Ceratopogonidae	0.25	-	0.94	3.835	6	Insensitive
Chironomidae	0.96	51	139.8	60.373	6	Insensitive
Chloroperlidae	0.28	3	2.4	6.443	1	Sensitive
Corixidae	0.09	-	0.16	0.618		
Culicidae	0.04	-	0	0	8	Tolerant
Curculionidae	0.03	-	0.02	0.141		
Deuterophlebiidae	0.02	-	0.02	0.141	0	Sensitive
Dixidae	0.04	-	0.1	0.364	1	Sensitive
Dytiscidae	0.13	-	0.62	1.627	5	Insensitive
Elmidae	0.04	-	0.26	1.7	4	Insensitive
Empididae	0.22	13	1.4	2.74	6	Insensitive
Ephemerellidae	0.26	-	2.34	7.372	1	Sensitive
Gammaridae	0.04	-	0.08	0.444	4	Insensitive
Glossiphoniidae	0.01	-	0.02	0.141	8	Tolerant
Glossosomatidae	0.05	-	0.5	2.667	0	Sensitive
Heptageniidae	0.35	4	6.5	13.406	4	Insensitive
Hyalellidae	0.02	-	0.06	0.314	8	Tolerant
Hydraenidae	0.01	-	0.02	0.141	5	Insensitive
Hydridae	0.00	-	0.12	0.849	8	Tolerant
Hydrobiidae	0.05	-	0	0	5	Insensitive
Hydrophilidae	0.02	-	0.16	0.889	4	Insensitive
Hydropsychidae	0.06	-	0.26	1.139	4	Insensitive
Hydroptilidae	0.06	-	0.04	0.283		
Hydrozetidae	0.02	-	0	0		
Hydryphantidae	0.02	-	0	0	8	Tolerant
Hygrobatidae	0.02	-	0.06	0.424		
Lebertiidae	0.18	-	0.58	2.417	8	Tolerant
Lepidostomatidae	0.00	-	0	0	3	Insensitive
Leptoceridae	0.01	-	0.06	0.424	4	Insensitive
Leptophlebiidae	0.06	-	0.12	0.48	2	Sensitive
Leuctridae	0.09	-	0.28	1.161	0	Sensitive
Limnephilidae	0.33	2	2.36	4.525	4	Insensitive
Limnesiidae	0.01	-	0.04	0.283		
Lumbriculidae	0.25	1	2.92	6.639	8	Tolerant
Lymnaeidae	0.11	-	0.32	1.077	6	Insensitive
Metretopodidae	0.01	-	0.24	1.697		

Muscidae	0.03	-	0.1	0.416	6	Insensitive
Naididae	0.36	7	7.22	12.425	10	Tolerant
Nemouridae	0.56	36	13.2	24.083	2	Sensitive
Peltoperlidae	0.01	-	0.02	0.141	2	Sensitive
Perlidae	0.01	-	0	0	1	Sensitive
Perlodidae	0.18	-	0.48	1.403	2	Sensitive
Phryganeidae	0.00	-	0	0	4	Insensitive
Physidae	0.03	-	0.06	0.424	8	Tolerant
Pisidiidae	0.00	-	0.88	3.456	8	Tolerant
Planariidae	0.00	-	0	0	1	Sensitive
Planorbidae	0.09	-	0.64	4.241	7	Tolerant
Psychodidae	0.19	-	0	0		
Rhyacophilidae	0.17	-	0.36	1.064	10	Tolerant
Scathophagidae	0.03	-	0.86	2.532	0	Sensitive
Simuliidae	0.60	45	0.02	0.141		
Sminthuridae	0.02	-	11.76	16.581	6	Insensitive
Sperchonidae	0.35	1	0	0	10	Tolerant
Sphaeriidae	0.11	-	2.16	3.553	8	Tolerant
Taeniopterygidae	0.00	-	0	0	2	Sensitive
Tipulidae	0.42	4	2.02	3.08	3	Insensitive
Tubificidae	0.03	-	0	0	10	Tolerant
Uenoidae	0.03	-	0.06	0.424	0	Sensitive
Valvatidae	0.05	-	1.1	4.258	8	Tolerant

Note: All the organisms' with a probability of .05 or lower are not included on this list, if all the columns had zeros in them.

Site Assessment Graphs



Site YPS 153 and Gp 3 reference sites.
Probability ellipses plotted: 75, 90, 99, and 99.9% around reference sites.

Assessed in Band 1 – unstressed (all axes)

Site Assessment Vector Data

Assessment For The Test Site	
Unstressed	Unstressed
Unstressed	Unstressed
Unstressed	Unstressed

Site Metrics

Metric Name	Test Site	Reference Group Mean	Standard Deviation	Sample Size
Total Abundance	**240.0**	**44.227**	**43.526**	**22**
Total No. of Taxa	**13.0**	**6.364**	**3.593**	**22**

Site Assessment Report

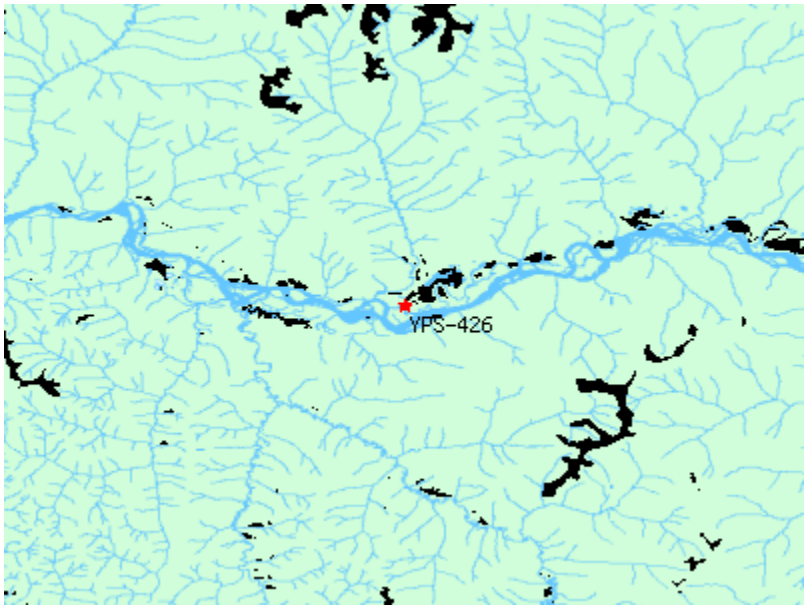
Site Metadata

Site	YPS-426
Sample Date	July 19 2010
Latitude	N 63° 19' 48"
Longitude	W 138° 17' 46"
Altitude	1280
Feature Name	Valley Creek
Stream Order	4

Site Photograph

Up Stream

Context Map



BEAST Prediction Results

Predictor Variables	Altitude,Landcover - Alpine,Landcover - Forest,Landcover - Unregen Forest,Landcover - Wetland,Longitude,Precip Rainfall JAN (mm),Precip Snowfall JUN (mm),Stream density (m stream/km2 catchment),Temp Max JAN (deg C)
Predicted Group Number	4

Group	**1**	**2**	**3**	**4**	**5**
Probability	3.3%	1.0%	3.2%	87.1%	5.4%

Habitat Attributes

Variable	Site	Reference Group Mean	Standard Deviation	Sample Size
Bedrock Geology - Intrusive (%)	0	6.075	19.14	83
Bedrock Geology - Metamorphic (%)	99.99	12.5	28.727	83
Bedrock Geology - Sedimentary (%)	0	65.324	44.692	83
Bedrock Geology - Sedimentary/Volcanic (%)		3.054	10.333	83
Bedrock Geology - Ultramafic (%)	0	1.016	5.484	83
Bedrock Geology - Ultramafic/Metamorphic (%)				83
Bedrock Geology - Unconsolidated (%)	0	2.207	11.231	83
Bedrock Geology - Volcanic (%)	0	3.617	14.321	83
Canopy - % coverage (PercentRange)	2			83
Carbon - dissolved organic (DOC) (mg/L)	18.3			83
Channel Depth - avg (cm)	40.6			83
Channel Depth - max (cm)	58	31.984	28.413	83
Chloride - dissolved (mg/L)	0.3			83
Direct Velocity Measuremen Instrument (Category (1-3))	3			83
Drainage Area (km^2)	170.5	131.838	230.495	83
F (mg/L)	0.14			83
General - Conductivity (uS/cm)	65	230.84	179.366	83
General - dissolved oxygen (DO) (mg/L)	11.59			83
General - pH (pH)	7.8	7.662	0.59	83
General - Specific Conductance (@ 25 C) (uS/cm)	105			83
General - Turbidity (NTU)	63.8			83
Habitats - pools (Binary)	1			83
Habitats - rapids (Binary)	0			83
Habitats - riffles (Binary)	1			83
Habitats - straight run (Binary)	1			83
Hg (ppm)				83
Hg (ng/L)				83
Landcover - Alpine (%)	0.26	27.34	33	83
Landcover - Forest (%)	70.08	19.085	27.643	83
Landcover - Lake (%)	0	0.426	1.585	83
Landcover - Nonprod Forest (%)	19.93	29.604	32.428	83
Landcover - River (%)	0			83
Landcover - Unregen Forest (%)	9.71	1.71	6.039	83
Landcover - Urban (%)	0			83
Landcover - Wetland (%)	0.02	0.352	1.251	83
Macrophyte (PercentRange)	1			83

Nitrogen - ammonia (mg/L)	0.001			83
Nitrogen - nitrate + nitrite (mg/L)	0.048			83
Nitrogen - nitrite (mg/L)	0.004			83
Perimeter - upstream drainage area (Km)	75.9	65.12	49.564	83
Phosphorus - total (mg/L)	0.164			83
Precip Rainfall JAN (mm) (mm)	0	0.253	0.647	83
Precip Rainfall JUN (mm) (mm)	29.9	40.631	11.467	83
Precip Rainfall Total ANNUAL (mm) (mm)	168.8	197.402	64.931	83
Precip Snowfall JAN (mm) (mm)	17	18.955	9.044	83
Precip Snowfall JUN (mm) (mm)	1.4	0.778	1.143	83
Precip Snowfall Total ANNUAL (mm) (mm)	139.6	134.943	45.395	83
Precip Total ANNUAL (mm) (mm)	272.8	321.49	104.112	83
Precip Total JAN (mm) (mm)	12.1	17.705	8.964	83
Precip Total JUN (mm) (mm)	31.4	41.572	11.593	83
Riparian - coniferous trees (Binary)	1			83
Riparian - deciduous trees (Binary)	1			83
Riparian - grasses/ferns (Binary)	1			83
Riparian - shrubs (Binary)	1			83
Slope (m/m)	0.025			83
SO4 (mg/L)	7.3			83
Solids - Total Dissolved (TDS filterable residue) (mg/L)	120			83
Solids - total suspended (TSS) (mg/L)	134			83
Stream density (m stream/km2 catchment) (m/km^2)	940.5	456.436	294.056	83
Stream length (m) in catchment (m)	160386	60684.3	110582.7	83
Substrate - 2nd dominant size category (Category(0-9))	7			83
Substrate - dominant size category (Category(0-9))	5	4.723	2.171	83
Substrate - embeddedness category (Category(1-5))	3	3.831	0.881	83
Substrate - surrounding material size category (Category(0-9))	1			83
Temp Max JAN (deg C) (Degrees Celsius)	-25.3	-21.486	3.258	83
Temp Max JUN (deg C) (Degrees Celsius)	8	18.137	2.769	83
Temp Mean JAN (deg C) (Degrees Celsius)	-29	-26.277	2.92	83
Temp Mean JUN (deg C) (Degrees Celsius)	4.4	11.572	2.238	83
Temp Min JAN(deg C) (Degrees Celsius)	-33.6	-31.694	2.875	83
Temp Min JUN (deg C) (Degrees Celsius)	0.7	5.118	1.669	83
Temperature - air (Degrees Celsius)	19			83
Temperature - lake surface or stream (Degrees Celsius)	5.09			83
Velocity (Avg) (m/s)	0.53	0.644	0.886	83
Velocity (Max) (m/s)	0.74			83
Velocity Measurement Method (Category (1-3))	3			83
Width - Bankfull (m)	10.9			83
Width - Wetted (m)	7.5	6.78	5.88	83

Bray-Curtis Analysis

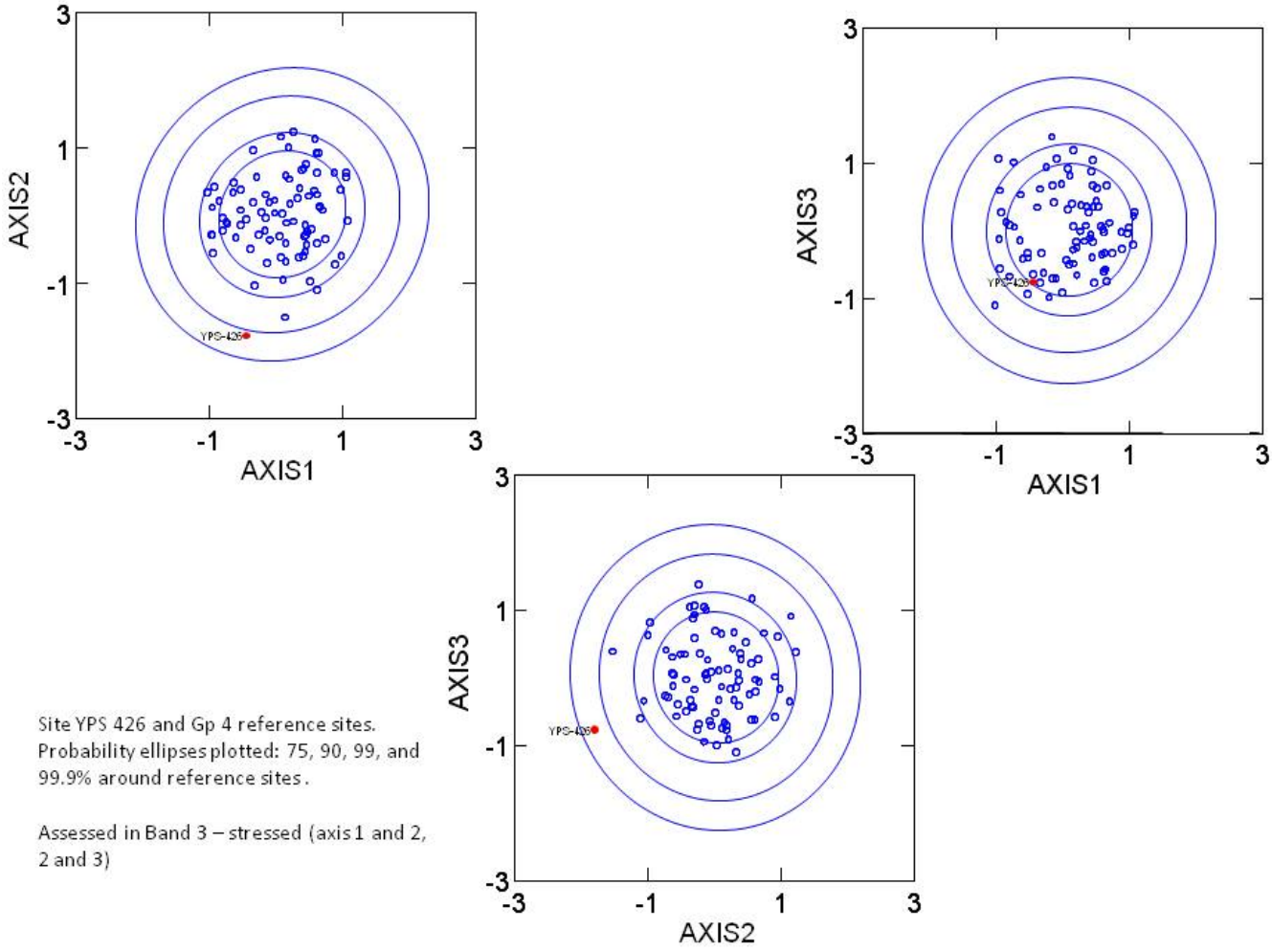
Description	Value
Bray-Curtis Distance	0.07
Bray Curtis Reference Median	2664.38

RIVPACS Analysis

Taxa	Probability Of Occurrence	2010 Total Abundance	Mean of Abundance for Reference sites in Group 4	SD of Abundance for Reference sites in Group 4	Benthic Invertebrate Taxa Tolerance	
Ameletidae	0.32	1	9.456	27.8	0	Sensitive
Apataniidae	0.03	-	0.748	4.947	1	Sensitive
Aturidae	0.05	-	0.411	1.914		
Baetidae	0.91	8	266.355	335.387	4	Insensitive
Brachycentridae	0.17	-	12	67.79	1	Sensitive
Caenidae	0.00	-	0	0	7	Tolerant
Capniidae	0.47	-	38.278	128.73	1	Sensitive
Ceratopogonidae	0.26	-	10.467	30.596	6	Insensitive
Chironomidae	1.00	51	802.805	729.921	6	Insensitive
Chloroperlidae	0.41	1	22.267	65.022	1	Sensitive
Corixidae	0.02	-	0.506	4.61		
Culicidae	0.00	-	0	0	8	Tolerant
Curculionidae	0.01	-	0.024	0.22		
Deuterophlebiidae	0.00	-	0	0	0	Sensitive
Dixidae	0.03	-	0.689	4.738	1	Sensitive
Dolichopodidae	0.01	-	0.063	0.577		
Dytiscidae	0.17	-	4.342	21.087	5	Insensitive
Elmidae	0.01	-	0	0	4	Insensitive
Empididae	0.56	19	15.69	23.306	6	Insensitive
Ephemerellidae	0.33	-	45.387	181.354	1	Sensitive
Feltriidae	0.06	-	0.536	2.685		
Gammaridae	0.09	-	15.022	67.781	4	Insensitive
Glossiphoniidae	0.00	-	0	0	8	Tolerant
Glossosomatidae	0.14	-	2.562	7.672	0	Sensitive
Heptageniidae	0.70	105	125.1	224.978	4	Insensitive
Hyalellidae	0.04	-	0.854	4.15	8	Tolerant
Hydraenidae	0.00	-	0	0	5	Insensitive
Hydridae	0.03	-	0	0	8	Tolerant
Hydrobiidae	0.01	-	0	0	5	Insensitive
Hydrophilidae	0.00	-	1.374	6.206	4	Insensitive
Hydropsychidae	0.07	-	1.022	6.379	4	Insensitive
Hydroptilidae	0.04	1	2.975	7.957		
Hydrozetidae	0.26	-	0	0		
Hydryphantidae	0.01	-	6.942	19.855	8	Tolerant
Hygrobatidae	0.22		0.241	1.985		
Lebertiidae	0.50	-	25.081	56.375	8	Tolerant
Lepidostomatidae	0.03	-	11.596	104.268	3	Insensitive
Leptoceridae	0.02	-	0.301	2.744	4	Insensitive
Leptophlebiidae	0.09	-	10.918	44.525	2	Sensitive

Leuctridae	0.08	-	1.033	4.639	0	Sensitive
Limnephilidae	0.42	23	12.781	42.161	4	Insensitive
Limnesiidae	0.07	-	1.265	7.078		
Limnocharidae	0.01	-	0.012	0.11		
Lumbriculidae	0.31	10	47.107	133.253	8	Tolerant
Lymnaeidae	0.04	-	1.02	7.439	6	Insensitive
Metretopodidae	0.01	-	0.201	1.829		
Mideopsidae	0.01	-	0.151	1.372		
Muscidae	0.11	-	0.884	3.454	6	Insensitive
Naididae	0.22	-	14.354	45.061	10	Tolerant
Nemouridae	0.81	-	199.788	481.869	2	Sensitive
Oribatidae	0.01	-	0.151	1.372		
Oxidae	0.02	-	1.021	8.79		
Peltoperlidae	0.00	-	0	0	2	Sensitive
Perlidae	0.02	-	0.098	0.79	1	Sensitive
Perlodidae	0.38	10	10.64	21.321	2	Sensitive
Phryganeidae	0.00	-	0	0	4	Insensitive
Physidae	0.05	-	2.39	13.964	8	Tolerant
Pionidae	0.03	-	0.231	1.547		
Pisidiidae	0.01	-	4.957	28.431	8	Tolerant
Planariidae	0.01	-	0.402	3.658	1	Sensitive
Planorbidae	0.03	-	0.217	1.976	7	Tolerant
Psychodidae	0.22		0.024	0.22		
Rhyacophilidae	0.22	-	4.936	15.808	10	Tolerant
Scathophagidae	0.00	-	5.978	17.547	0	Sensitive
Simuliidae	0.91	-	0	0		
Sminthuridae	0.00	-	196.279	344.165	6	Insensitive
Sperchonidae	0.58	1	0	0	10	Tolerant
Sphaeriidae	0.08	1	26.463	53.194	8	Tolerant
Staphylinidae	0.01	-	0.05	0.457		
Stratiomyidae	0.02	-	0.099	0.658		
Stygothrombidiidae	0.01	-	0.145	1.317		
Taeniopterygidae	0.01	-	0.057	0.522	2	Sensitive
Tipulidae	0.59	7	20.236	44.586	3	Insensitive
Torrenticolidae	0.05	-	1.625	12.857		
Tubificidae	0.16	-	17.054	100.978	10	Tolerant
Uenoidae	0.04	-	1.819	12.652	0	Sensitive
Valvatidae	0.10	-	8.286	43.046	8	Tolerant

Site Assessment Graphs



Site YPS 426 and Gp 4 reference sites.
Probability ellipses plotted: 75, 90, 99, and 99.9% around reference sites.

Assessed in Band 3 – stressed (axis 1 and 2, 2 and 3)

Site Assessment Vector Data

Assessment For The Test Site	
Vector 1 Vs Vector 2	Stressed
Vector 1 Vs Vector 3	Unstressed
Vector 2 Vs Vector 3	Stressed
Overall	Stressed

Site Metrics

Metric Name	Test Site	Reference Group Mean	Standard Deviation	Sample Size
Total Abundance	**238**	**2021.304**	**1341.27**	**83**
Total No. of Taxa	**13**	**13.169**	**4.601**	**83**

Site Assessment Report

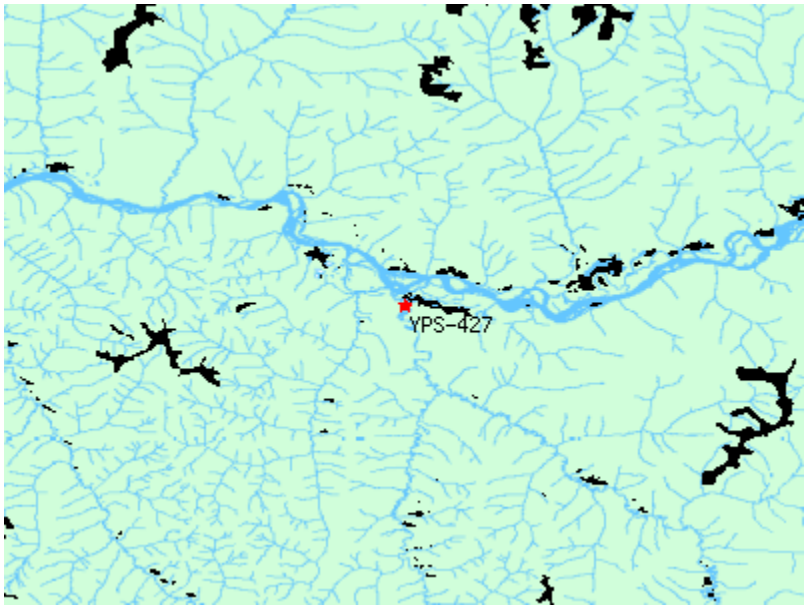
Site Metadata

Site	YPS-427
Sample Date	July 19 2010
Latitude	N 63° 16' 41"
Longitude	W 138° 24' 49"
Altitude	1308
Feature Name	Rosebud Creek
Stream Order	5

Site Photograph

Up Stream

Context Map



BEAST Prediction Results

Predictor Variables	Altitude,Landcover - Alpine,Landcover - Forest,Landcover - Unregen Forest,Landcover - Wetland,Longitude,Precip Rainfall JAN (mm),Precip Snowfall JUN (mm),Stream density (m stream/km2 catchment),Temp Max JAN (deg C)
Predicted Group Number	4

Group	1	2	3	4	5
Probability	4.5%	1.4%	21.5%	63.2%	9.3%

Habitat Attributes

Variable	Site	Reference Group Mean	Standard Deviation	Sample Size
Bedrock Geology - Intrusive (%)	10.99	6.075	19.14	83
Bedrock Geology - Metamorphic (%)	77.42	12.5	28.727	83
Bedrock Geology - Sedimentary (%)	0	65.324	44.692	83
Bedrock Geology - Sedimentary/Volcanic (%)		3.054	10.333	83
Bedrock Geology - Ultramafic (%)	1.34	1.016	5.484	83
Bedrock Geology - Ultramafic/Metamorphic (%)				83
Bedrock Geology - Unconsolidated (%)	0	2.207	11.231	83
Bedrock Geology - Volcanic (%)	10.25	3.617	14.321	83
Canopy - % coverage (PercentRange)	1			83
Carbon - dissolved organic (DOC) (mg/L)	23.9			83
Channel Depth - avg (cm)	60.4			83
Channel Depth - max (cm)	76	31.984	28.413	83
Chloride - dissolved (mg/L)	0.3			83
Direct Velocity Measuremen Instrument (Category (1-3))	3			83
Drainage Area (km^2)	1682.5	131.838	230.495	83
F (mg/L)	0.13			83
General - Conductivity (uS/cm)	136	230.84	179.366	83
General - dissolved oxygen (DO) (mg/L)	10.23			83
General - pH (pH)	7.9	7.662	0.59	83
General - Specific Conductance (@ 25 C) (uS/cm)	186			83
General - Turbidity (NTU)	3.03			83
Habitats - pools (Binary)	1			83
Habitats - rapids (Binary)	0			83
Habitats - riffles (Binary)	1			83
Habitats - straight run (Binary)	1			83
Hg (ppm)				83
Hg (ng/L)				83
Landcover - Alpine (%)	0.41	27.34	33	83
Landcover - Forest (%)	54.05	19.085	27.643	83
Landcover - Lake (%)	0.08	0.426	1.585	83
Landcover - Nonprod Forest (%)	6.48	29.604	32.428	83
Landcover - River (%)	0.01			83
Landcover - Unregen Forest (%)	38.31	1.71	6.039	83
Landcover - Urban (%)	0			83
Landcover - Wetland (%)	0.61	0.352	1.251	83
Macrophyte (PercentRange)	0			83
Nitrogen - ammonia (mg/L)	0.001			83

Nitrogen - nitrate + nitrite (mg/L)	0.006			83
Nitrogen - nitrite (mg/L)	0.004			83
Perimeter - upstream drainage area (Km)	271.5	65.12	49.564	83
Phosphorus - total (mg/L)	0.022			83
Precip Rainfall JAN (mm) (mm)	0	0.253	0.647	83
Precip Rainfall JUN (mm) (mm)	29.9	40.631	11.467	83
Precip Rainfall Total ANNUAL (mm) (mm)	168.8	197.402	64.931	83
Precip Snowfall JAN (mm) (mm)	17	18.955	9.044	83
Precip Snowfall JUN (mm) (mm)	1.4	0.778	1.143	83
Precip Snowfall Total ANNUAL (mm) (mm)	139.6	134.943	45.395	83
Precip Total ANNUAL (mm) (mm)	272.8	321.49	104.112	83
Precip Total JAN (mm) (mm)	12.1	17.705	8.964	83
Precip Total JUN (mm) (mm)	31.4	41.572	11.593	83
Riparian - coniferous trees (Binary)	1			83
Riparian - deciduous trees (Binary)	1			83
Riparian - grasses/ferns (Binary)	1			83
Riparian - shrubs (Binary)	1			83
Slope (m/m)	0.01			83
SO4 (mg/L)	29			83
Solids - Total Dissolved (TDS filterable residue) (mg/L)	156			83
Solids - total suspended (TSS) (mg/L)				83
Stream density (m stream/km2 catchment) (m/km^2)	963.3	456.436	294.056	83
Stream length (m) in catchment (m)	1620686	60684.3	110582.7	83
Substrate - 2nd dominant size category (Category(0-9))	7			83
Substrate - dominant size category (Category(0-9))	5	4.723	2.171	83
Substrate - embeddedness category (Category(1-5))	3	3.831	0.881	83
Substrate - surrounding material size category (Category(0-9))	1			83
Temp Max JAN (deg C) (Degrees Celsius)	-25.3	-21.486	3.258	83
Temp Max JUN (deg C) (Degrees Celsius)	8	18.137	2.769	83
Temp Mean JAN (deg C) (Degrees Celsius)	-29	-26.277	2.92	83
Temp Mean JUN (deg C) (Degrees Celsius)	4.4	11.572	2.238	83
Temp Min JAN(deg C) (Degrees Celsius)	-33.6	-31.694	2.875	83
Temp Min JUN (deg C) (Degrees Celsius)	0.7	5.118	1.669	83
Temperature - air (Degrees Celsius)	21			83
Temperature - lake surface or stream (Degrees Celsius)	10.93			83
Velocity (Avg) (m/s)	0.84	0.644	0.886	83
Velocity (Max) (m/s)	1.04			83
Velocity Measurement Method (Category (1-3))	3			83
Width - Bankfull (m)	18			83
Width - Wetted (m)	16.2	6.78	5.88	83

Bray-Curtis Analysis

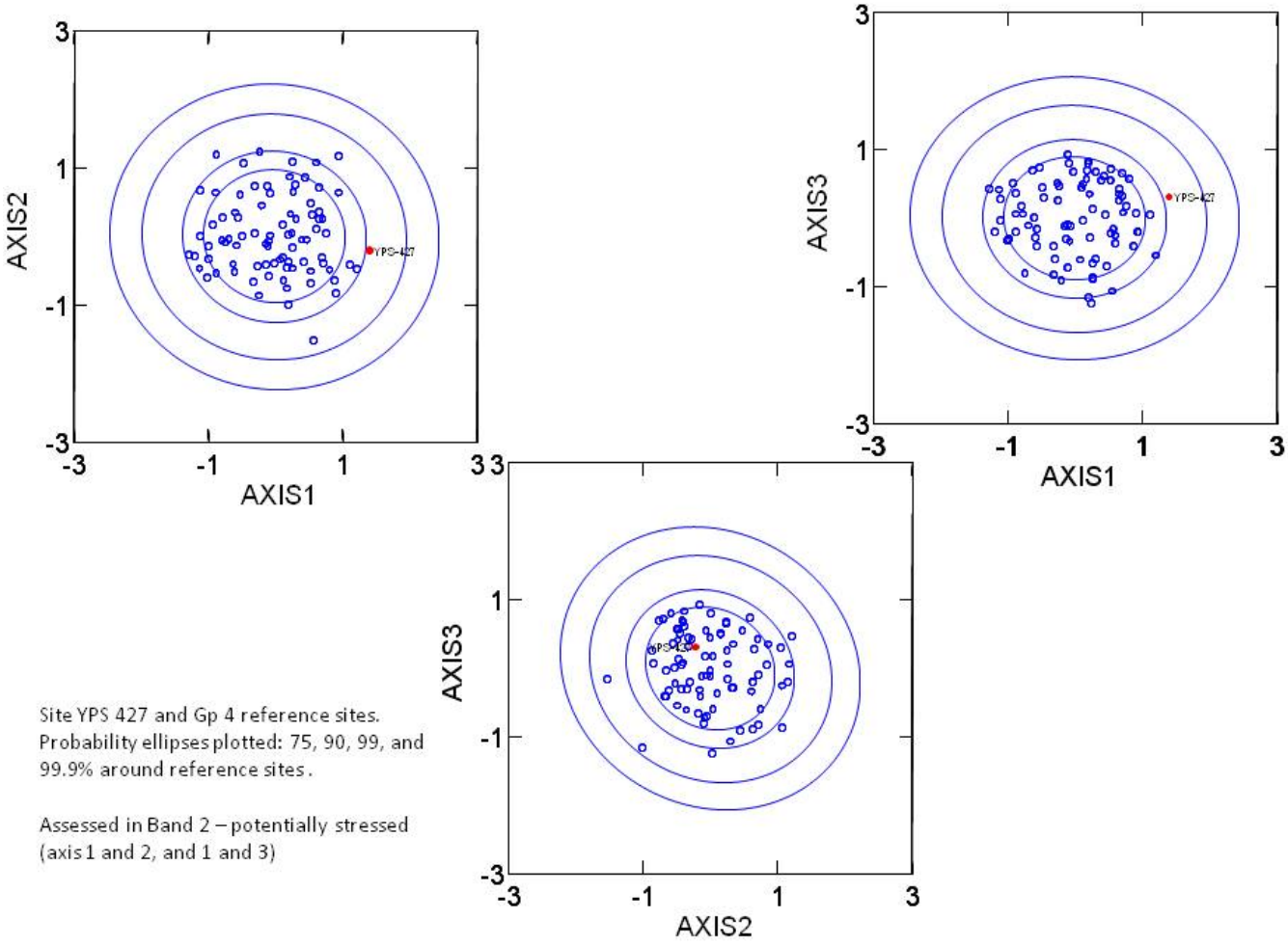
Description	Value
Bray-Curtis Distance	0.23
Bray Curtis Reference Median	2664.38

RIVPACS Analysis

Taxa	Probability of Occurrence	2010 Total Abundance	Mean of Abundance for Reference sites in Group 4	SD of Abundance for Reference sites in Group 4	Benthic Invertebrate Taxa Tolerance	
Ameletidae	0.26	5	9.456	27.8	0	Sensitive
Apataniidae	0.02	-	0.748	4.947	1	Sensitive
Aturidae	0.04	2	0.411	1.914		
Baetidae	0.8	131	266.355	335.387	4	Insensitive
Brachycentridae	0.15	-	12	67.79	1	Sensitive
Caenidae	0.01	-	0	0	7	Tolerant
Capniidae	0.41	-	38.278	128.73	1	Sensitive
Ceratopogonidae	0.25	13	10.467	30.596	6	Insensitive
Chironomidae	0.98	82	802.805	729.921	6	Insensitive
Chloroperlidae	0.36	28	22.267	65.022	1	Sensitive
Corixidae	0.03	-	0.506	4.61		
Culicidae	0.02	-	0	0	8	Tolerant
Curculionidae	0.02	-	0.024	0.22		
Dixidae	0.03	-	0.689	4.738	1	Sensitive
Dolichopodidae	0.01	-	0.063	0.577		
Dytiscidae	0.14	2	4.342	21.087	5	Insensitive
Elmidae	0.02	-	0	0	4	Insensitive
Empididae	0.44	15	15.69	23.306	6	Insensitive
Ephemerellidae	0.3	17	45.387	181.354	1	Sensitive
Feltriidae	0.05	-	0.536	2.685		
Gammaridae	0.09	-	15.022	67.781	4	Insensitive
Glossosomatidae	0.1	-	2.562	7.672	0	Sensitive
Heptageniidae	0.59	-	125.1	224.978	4	Insensitive
Hirudinidae	0.01	-	0	0		
Hyalellidae	0.03	-	0.854	4.15	8	Tolerant
Hydrobiidae	0.03	-	0	0	8	Tolerant
Hydrophilidae	0.01	2	0	0	5	Insensitive
Hydropsychidae	0.07	5	1.374	6.206	4	Insensitive
Hydroptilidae	0.04	-	1.022	6.379	4	Insensitive
Hydrozetidae	0.21	-	2.975	7.957		
Hygrobatidae	0.16	22	6.942	19.855	8	Tolerant
Isotomidae			0.241	1.985		
Lebertiidae	0.42	13	25.081	56.375	8	Tolerant
Lepidostomatidae	0.03	-	11.596	104.268	3	Insensitive
Leptoceridae	0.02	-	0.301	2.744	4	Insensitive
Leptophlebiidae	0.08	11	10.918	44.525	2	Sensitive
Leuctridae	0.08	1	1.033	4.639	0	Sensitive
Limnephilidae	0.35	4	12.781	42.161	4	Insensitive
Limnesiidae	0.05	-	1.265	7.078		

Limnocharidae	0.01	-	0.012	0.11		
Lumbriculidae	0.29	17	47.107	133.253	8	Tolerant
Lymnaeidae	0.06	-	1.02	7.439	6	Insensitive
Metretopodidae	0.01	-	0.201	1.829		
Mideopsidae	0.01	-	0.151	1.372		
Muscidae	0.08	-	0.884	3.454	6	Insensitive
Naididae	0.24	-	14.354	45.061	10	Tolerant
Nemouridae	0.72	-	199.788	481.869	2	Sensitive
Oribatidae	0.01	-	0.151	1.372		
Oxidae	0.02	-	1.021	8.79		
Perlidae	0.02	-	0.098	0.79	1	Sensitive
Perlodidae	0.34	2	10.64	21.321	2	Sensitive
Physidae	0.05	-	2.39	13.964	8	Tolerant
Pionidae	0.02	-	0.231	1.547		
Pisidiidae	0.11	-	4.957	28.431	8	Tolerant
Planariidae	0.01	-	0.402	3.658	1	Sensitive
Planorbidae	0.05	-	0.217	1.976	7	Tolerant
Poduridae			0.024	0.22		
Psychodidae	0.21	13	4.936	15.808	10	Tolerant
Rhyacophilidae	0.18	-	5.978	17.547	0	Sensitive
Scathophagidae	0.01	-	0	0		
Simuliidae	0.8	41	196.279	344.165	6	Insensitive
Sminthuridae	0.01	-	0	0	10	Tolerant
Sperchonidae	0.49	15	26.463	53.194	8	Tolerant
Staphylinidae	0.01	-	0.05	0.457		
Stratiomyidae	0.02	-	0.099	0.658		
Stygothrombidiidae	0.01	-	0.145	1.317		
Taeniopterygidae	0.02	-	0.057	0.522	2	Sensitive
Tipulidae	0.53	21	20.236	44.586	3	Insensitive
Torrenticolidae	0.04	-	1.625	12.857		
Tubificidae	0.12	-	17.054	100.978	10	Tolerant
Uenoidae	0.03	-	1.819	12.652	0	Sensitive
Valvatidae	0.08	1	8.286	43.046	8	Tolerant

Site Assessment Graphs



Site YPS 427 and Gp 4 reference sites.
Probability ellipses plotted: 75, 90, 99, and 99.9% around reference sites.

Assessed in Band 2 – potentially stressed (axis 1 and 2, and 1 and 3)

Site Assessment Vector Data

Assessment For The Test Site	
Vector 1 Vs Vector 2	Potentially Stressed
Vector 1 Vs Vector 3	Potentially Stressed
Vector 2 Vs Vector 3	Unstressed
Overall	Potentially Stressed

Site Metrics

Metric Name	Test Site	Reference Group Mean	Standard Deviation	Sample Size
Total Abundance	**463**	**2021.304**	**1341.27**	**83**
Total No. of Taxa	**23**	**13.169**	**4.601**	**83**

Site Assessment Report

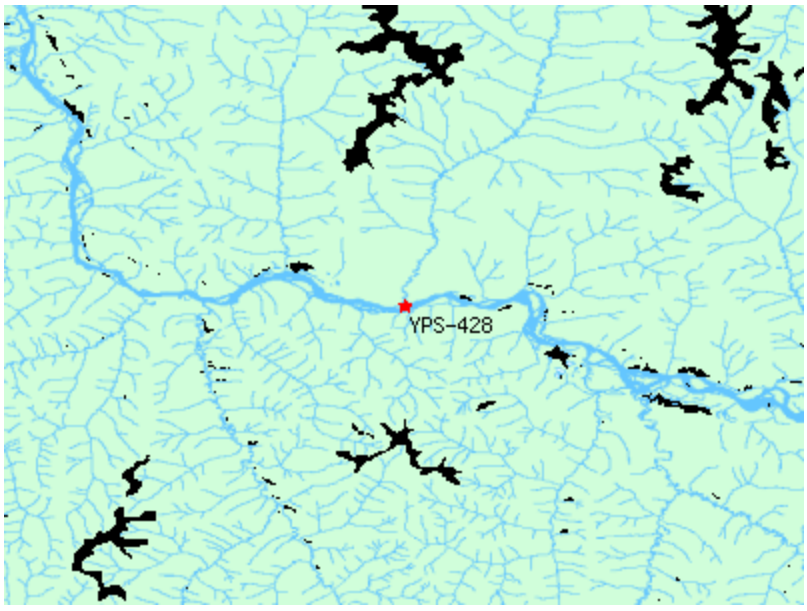
Site Metadata

Site	YPS-428
Sample Date	July 19 2010
Latitude	N 63° 15' 18"
Longitude	W 138° 41' 24"
Altitude	1248
Feature Name	Black Hills Creek
Stream Order	4

Site Photograph

Up Stream

Context Map



BEAST Prediction Results

Predictor Variables	Altitude,Landcover - Alpine,Landcover - Forest,Landcover - Unregen Forest,Landcover - Wetland,Longitude,Precip Rainfall JAN (mm),Precip Snowfall JUN (mm),Stream density (m stream/km2 catchment),Temp Max JAN (deg C)
Predicted Group Number	4

Group	1	2	3	4	5
Probability	4.7%	1.3%	3.5%	84.8%	5.8%

Habitat Attributes

Variable	Site	Reference Group Mean	Standard Deviation	Sample Size
Bedrock Geology - Intrusive (%)	0	6.075	19.14	83
Bedrock Geology - Metamorphic (%)	89.6	12.5	28.727	83
Bedrock Geology - Sedimentary (%)	0	65.324	44.692	83
Bedrock Geology - Sedimentary/Volcanic (%)		3.054	10.333	83
Bedrock Geology - Ultramafic (%)	0	1.016	5.484	83
Bedrock Geology - Ultramafic/Metamorphic (%)				83
Bedrock Geology - Unconsolidated (%)	0	2.207	11.231	83
Bedrock Geology - Volcanic (%)	10.4	3.617	14.321	83
Canopy - % coverage (PercentRange)	1			83
Carbon - dissolved organic (DOC) (mg/L)	17			83
Channel Depth - avg (cm)	74.4			83
Channel Depth - max (cm)	83	31.984	28.413	83
Chloride - dissolved (mg/L)	0.5			83
Direct Velocity Measuremen Instrument (Category (1-3))				83
Drainage Area (km^2)	415.2	131.838	230.495	83
F (mg/L)	0.12			83
General - Conductivity (uS/cm)	141	230.84	179.366	83
General - dissolved oxygen (DO) (mg/L)	10.54			83
General - pH (pH)	8	7.662	0.59	83
General - Specific Conductance (@ 25 C) (uS/cm)	191			83
General - Turbidity (NTU)	96.4			83
Habitats - pools (Binary)	1			83
Habitats - rapids (Binary)	0			83
Habitats - riffles (Binary)	0			83
Habitats - straight run (Binary)	1			83
Hg (ppm)				83
Hg (ng/L)				83
Landcover - Alpine (%)	0.81	27.34	33	83
Landcover - Forest (%)	74.05	19.085	27.643	83
Landcover - Lake (%)	0	0.426	1.585	83
Landcover - Nonprod Forest (%)	18.5	29.604	32.428	83
Landcover - River (%)	0			83
Landcover - Unregen Forest (%)	6.05	1.71	6.039	83
Landcover - Urban (%)	0.57			83
Landcover - Wetland (%)	0	0.352	1.251	83
Macrophyte (PercentRange)	0			83
Nitrogen - ammonia (mg/L)	0.001			83

Nitrogen - nitrate + nitrite (mg/L)	0.043			83
Nitrogen - nitrite (mg/L)	0.006			83
Perimeter - upstream drainage area (Km)	134.8	65.12	49.564	83
Phosphorus - total (mg/L)	0.109			83
Precip Rainfall JAN (mm) (mm)	0	0.253	0.647	83
Precip Rainfall JUN (mm) (mm)	29.9	40.631	11.467	83
Precip Rainfall Total ANNUAL (mm) (mm)	168.8	197.402	64.931	83
Precip Snowfall JAN (mm) (mm)	17	18.955	9.044	83
Precip Snowfall JUN (mm) (mm)	1.4	0.778	1.143	83
Precip Snowfall Total ANNUAL (mm) (mm)	139.6	134.943	45.395	83
Precip Total ANNUAL (mm) (mm)	272.8	321.49	104.112	83
Precip Total JAN (mm) (mm)	12.1	17.705	8.964	83
Precip Total JUN (mm) (mm)	31.4	41.572	11.593	83
Riparian - coniferous trees (Binary)	1			83
Riparian - deciduous trees (Binary)	1			83
Riparian - grasses/ferns (Binary)	1			83
Riparian - shrubs (Binary)	1			83
SO4 (mg/L)	29			83
Slope (m/m)				83
Solids - Total Dissolved (TDS filterable residue) (mg/L)	181			83
Solids - total suspended (TSS) (mg/L)	131			83
Stream density (m stream/km2 catchment) (m/km^2)	893.1	456.436	294.056	83
Stream length (m) in catchment (m)	370829	60684.26	110582.7	83
Substrate - 2nd dominant size category (Category(0-9))	1			83
Substrate - dominant size category (Category(0-9))	1	4.723	2.171	83
Substrate - embeddedness category (Category(1-5))	1	3.831	0.881	83
Substrate - surrounding material size category (Category(0-9))	1			83
Temp Max JAN (deg C) (Degrees Celsius)	-25.3	-21.486	3.258	83
Temp Max JUN (deg C) (Degrees Celsius)	8	18.137	2.769	83
Temp Mean JAN (deg C) (Degrees Celsius)	-29	-26.277	2.92	83
Temp Mean JUN (deg C) (Degrees Celsius)	4.4	11.572	2.238	83
Temp Min JAN(deg C) (Degrees Celsius)	-33.6	-31.694	2.875	83
Temp Min JUN (deg C) (Degrees Celsius)	0.7	5.118	1.669	83
Temperature - air (Degrees Celsius)	21			83
Temperature - lake surface or stream (Degrees Celsius)	11.34			83
Velocity (Avg) (m/s)	0.28	0.644	0.886	83
Velocity (Max) (m/s)	0.39			83
Velocity Measurement Method (Category (1-3))	3			83
Width - Bankfull (m)	12.5			83
Width - Wetted (m)	9	6.78	5.88	83

Bray-Curtis Analysis

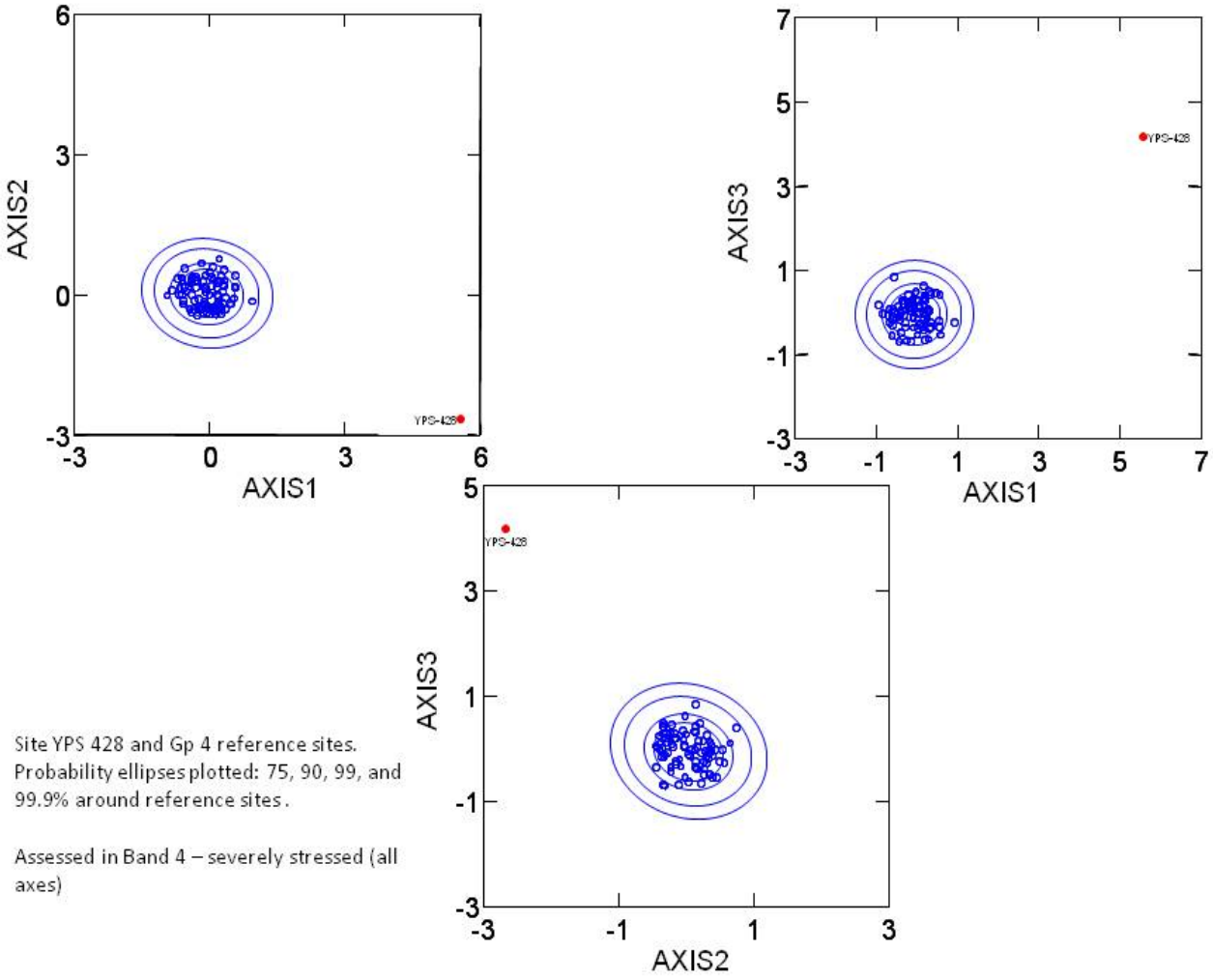
Description	Value
Bray-Curtis Distance	0.35
Bray Curtis Reference Median	2664.38

RIVPACS Analysis

Taxa	Probability of Occurrence	2010 Total Abundance	Mean of Abundance for Reference sites in Group 4	SD of Abundance for Reference sites in Group 4	Benthic Invertebrate Taxa Tolerance	
Ameletidae	0.32	-	9.456	27.8	0	Sensitive
Apataniidae	0.02	-	0.748	4.947	1	Sensitive
Aturidae	0.05	-	0.411	1.914		
Baetidae	0.9	6	266.355	335.387	4	Insensitive
Brachycentridae	0.17	-	12	67.79	1	Sensitive
Caenidae	0.01	-	0	0	7	Tolerant
Capniidae	0.47	-	38.278	128.73	1	Sensitive
Ceratopogonidae	0.26	-	10.467	30.596	6	Insensitive
Chironomidae	1	4	802.805	729.921	6	Insensitive
Chloroperlidae	0.4	-	22.267	65.022	1	Sensitive
Corixidae	0.02	-	0.506	4.61		
Curculionidae	0.01	-	0.024	0.22		
Dixidae	0.03	-	0.689	4.738	1	Sensitive
Dolichopodidae	0.01	-	0.063	0.577		
Dytiscidae	0.17	-	4.342	21.087	5	Insensitive
Elmidae	0.01	-	0	0	4	Insensitive
Empididae	0.55	-	15.69	23.306	6	Insensitive
Ephemerellidae	0.32	-	45.387	181.354	1	Sensitive
Feltriidae	0.06	-	0.536	2.685		
Gammaridae	0.09	-	15.022	67.781	4	Insensitive
Glossosomatidae	0.14	-	2.562	7.672	0	Sensitive
Heptageniidae	0.7	-	125.1	224.978	4	Insensitive
Hyalellidae	0.04	-	0.854	4.15	8	Tolerant
Hydrobiidae	0.01	-	0	0	8	Tolerant
Hydropsychidae	0.07	-	1.374	6.206	4	Insensitive
Hydroptilidae	0.04	-	1.022	6.379	4	Insensitive
Hydrozetidae	0.26	-	2.975	7.957		
Hydryphantidae	0.01	-	0	0		
Hygrobatidae	0.21	-	6.942	19.855	8	Tolerant
Isotomidae			0.241	1.985		
Lebertiidae	0.49	-	25.081	56.375	8	Tolerant
Lepidostomatidae	0.03	-	11.596	104.268	3	Insensitive
Leptoceridae	0.02	-	0.301	2.744	4	Insensitive
Leptophlebiidae	0.09	-	10.918	44.525	2	Sensitive
Leuctridae	0.08	-	1.033	4.639	0	Sensitive
Limnephilidae	0.41	-	12.781	42.161	4	Insensitive
Limnesiidae	0.07	-	1.265	7.078		
Limnocharidae	0.01	-	0.012	0.11		
Lumbriculidae	0.31	-	47.107	133.253	8	Tolerant

Lymnaeidae	0.04	-	1.02	7.439	6	Insensitive
Metretopodidae	0.01	-	0.201	1.829		
Mideopsidae	0.01	-	0.151	1.372		
Muscidae	0.11	-	0.884	3.454	6	Insensitive
Naididae	0.23	-	14.354	45.061	10	Tolerant
Nemouridae	0.81	-	199.788	481.869	2	Sensitive
Oribatidae	0.01	-	0.151	1.372		
Oxidae	0.02	-	1.021	8.79		
Perlidae	0.02	-	0.098	0.79	1	Sensitive
Perlodidae	0.38	-	10.64	21.321	2	Sensitive
Physidae	0.05	-	2.39	13.964	8	Tolerant
Pionidae	0.02	-	0.231	1.547		
Pisidiidae	0.09	-	4.957	28.431	8	Tolerant
Planariidae	0.01	-	0.402	3.658	1	Sensitive
Planorbidae	0.03	-	0.217	1.976	7	Tolerant
Poduridae			0.024	0.22		
Psychodidae	0.22	-	4.936	15.808	10	Tolerant
Rhyacophilidae	0.22	-	5.978	17.547	0	Sensitive
Simuliidae	0.91	-	196.279	344.165	6	Insensitive
Sperchonidae	0.57	-	26.463	53.194	8	Tolerant
Staphylinidae	0.01	-	0.05	0.457		
Stratiomyidae	0.02	-	0.099	0.658		
Stygothrombidiidae	0.01	-	0.145	1.317		
Taeniopterygidae	0.01	-	0.057	0.522	2	Sensitive
Tipulidae	0.58	-	20.236	44.586	3	Insensitive
Torrenticolidae	0.05	-	1.625	12.857		
Tubificidae	0.16	-	17.054	100.978	10	Tolerant
Uenoidae	0.04	-	1.819	12.652	0	Sensitive
Valvatidae	0.1	-	8.286	43.046	8	Tolerant

Site Assessment Graphs



Site YPS 428 and Gp 4 reference sites.
Probability ellipses plotted: 75, 90, 99, and 99.9% around reference sites.

Assessed in Band 4 – severely stressed (all axes)

Site Assessment Vector Data

Assessment For The Test Site	
Vector 1 Vs Vector 2	Severely Stressed
Vector 1 Vs Vector 3	Severely Stressed
Vector 2 Vs Vector 3	Severely Stressed
Overall	Severely Stressed

Site Metrics

Metric Name	Test Site	Reference Group Mean	Standard Deviation	Sample Size
Total Abundance	**10**	**2021.304**	**1341.27**	**83**
Total No. of Taxa	**2**	**13.169**	**4.601**	**83**

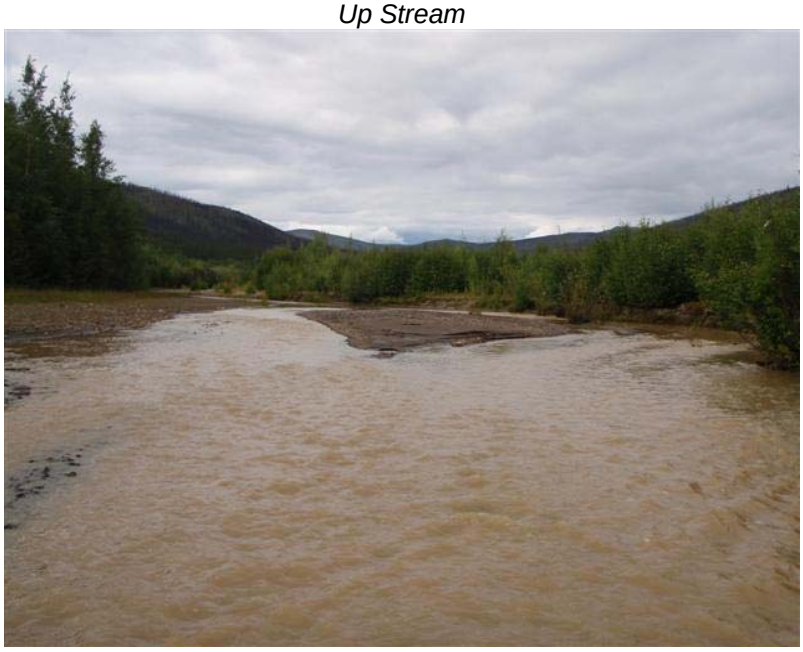
Site Assessment Report

Site Metadata

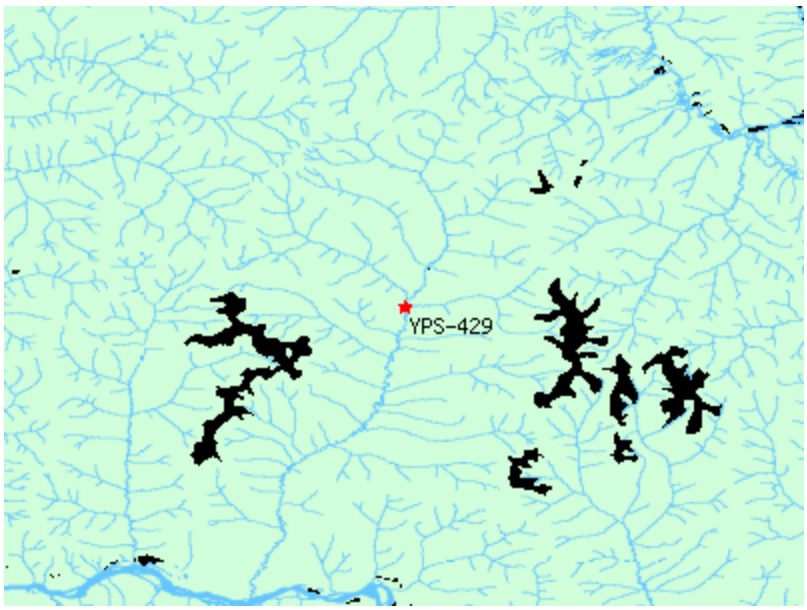
Site	YPS-429
Sample Date	July 19 2010
Latitude	N 63° 26' 18"
Longitude	W 138° 49' 24"
Altitude	1804
Feature Name	Black Hills Creek (Upper)
Stream Order	4

Site Photograph

Up Stream



Context Map



BEAST Prediction Results

Predictor Variables	Altitude,Landcover - Alpine,Landcover - Forest,Landcover - Unregen Forest,Landcover - Wetland,Longitude,Precip Rainfall JAN (mm),Precip Snowfall JUN (mm),Stream density (m stream/km2 catchment),Temp Max JAN (deg C)
Predicted Group Number	4

Group	1	2	3	4	5
Probability	18.5%	6.9%	15.0%	58.8%	0.8%

Habitat Attributes

Variable	Site	Reference Group Mean	Standard Deviation	Sample Size
Bedrock Geology - Intrusive (%)	0	6.075	19.14	83
Bedrock Geology - Metamorphic (%)	71.5	12.5	28.727	83
Bedrock Geology - Sedimentary (%)	0	65.324	44.692	83
Bedrock Geology - Sedimentary/Volcanic (%)		3.054	10.333	83
Bedrock Geology - Ultramafic (%)	0	1.016	5.484	83
Bedrock Geology - Ultramafic/Metamorphic (%)				83
Bedrock Geology - Unconsolidated (%)	0	2.207	11.231	83
Bedrock Geology - Volcanic (%)	28.5	3.617	14.321	83
Canopy - % coverage (PercentRange)	1			83
Carbon - dissolved organic (DOC) (mg/L)	14.1			83
Channel Depth - avg (cm)	13.4			83
Channel Depth - max (cm)	19	31.984	28.413	83
Chloride - dissolved (mg/L)	0.4			83
Direct Velocity Measuremen Instrument (Category (1-3))	3			83
Drainage Area (km^2)	151.3	131.838	230.495	83
F (mg/L)	0.13			83
General - Conductivity (uS/cm)	136	230.84	179.366	83
General - dissolved oxygen (DO) (mg/L)	10.41			83
General - pH (pH)	7.9	7.662	0.59	83
General - Specific Conductance (@ 25 C) (uS/cm)	185			83
General - Turbidity (NTU)	418			83
Habitats - pools (Binary)	1			83
Habitats - rapids (Binary)	0			83
Habitats - riffles (Binary)	1			83
Habitats - straight run (Binary)	1			83
Hg (ppm)				83
Hg (ng/L)				83
Landcover - Alpine (%)	0.44	27.34	33	83
Landcover - Forest (%)	62.8	19.085	27.643	83
Landcover - Lake (%)	0	0.426	1.585	83
Landcover - Nonprod Forest (%)	19.13	29.604	32.428	83
Landcover - River (%)	0			83
Landcover - Unregen Forest (%)	16.44	1.71	6.039	83
Landcover - Urban (%)	1.13			83
Landcover - Wetland (%)	0	0.352	1.251	83
Macrophyte (PercentRange)	0			83
Nitrogen - ammonia (mg/L)	0.001			83

Nitrogen - nitrate + nitrite (mg/L)	0.063			83
Nitrogen - nitrite (mg/L)	0.004			83
Perimeter - upstream drainage area (Km)	70.1	65.12	49.564	83
Phosphorus - total (mg/L)	0.185			83
Precip Rainfall JAN (mm) (mm)	0.3	0.253	0.647	83
Precip Rainfall JUN (mm) (mm)	42.7	40.631	11.467	83
Precip Rainfall Total ANNUAL (mm) (mm)	200.7	197.402	64.931	83
Precip Snowfall JAN (mm) (mm)	22	18.955	9.044	83
Precip Snowfall JUN (mm) (mm)	0	0.778	1.143	83
Precip Snowfall Total ANNUAL (mm) (mm)	156.9	134.943	45.395	83
Precip Total ANNUAL (mm) (mm)	346.2	321.49	104.112	83
Precip Total JAN (mm) (mm)	20.3	17.705	8.964	83
Precip Total JUN (mm) (mm)	42.5	41.572	11.593	83
Riparian - coniferous trees (Binary)	0			83
Riparian - deciduous trees (Binary)	1			83
Riparian - grasses/ferns (Binary)	1			83
Riparian - shrubs (Binary)	1			83
SO4 (mg/L)	32			83
Slope (m/m)				83
Solids - Total Dissolved (TDS filterable residue) (mg/L)	186			83
Solids - total suspended (TSS) (mg/L)	375			83
Stream density (m stream/km2 catchment) (m/km^2)	930.4	456.436	294.056	83
Stream length (m) in catchment (m)	140809.6	60684.3	110582.7	83
Substrate - 2nd dominant size category (Category(0-9))	7			83
Substrate - dominant size category (Category(0-9))	5	4.723	2.171	83
Substrate - embeddedness category (Category(1-5))	3	3.831	0.881	83
Substrate - surrounding material size category (Category(0-9))	1			83
Temp Max JAN (deg C) (Degrees Celsius)	-21.8	-21.486	3.258	83
Temp Max JUN (deg C) (Degrees Celsius)	20.9	18.137	2.769	83
Temp Mean JAN (deg C) (Degrees Celsius)	-26.4	-26.277	2.92	83
Temp Mean JUN (deg C) (Degrees Celsius)	13.8	11.572	2.238	83
Temp Min JAN(deg C) (Degrees Celsius)	-31	-31.694	2.875	83
Temp Min JUN (deg C) (Degrees Celsius)	6.8	5.118	1.669	83
Temperature - air (Degrees Celsius)	19			83
Temperature - lake surface or stream (Degrees Celsius)	11.24			83
Velocity (Avg) (m/s)	0.64	0.644	0.886	83
Velocity (Max) (m/s)	0.87			83
Velocity Measurement Method (Category (1-3))	3			83
Width - Bankfull (m)	25.2			83
Width - Wetted (m)	6	6.78	5.88	83

Bray-Curtis Analysis

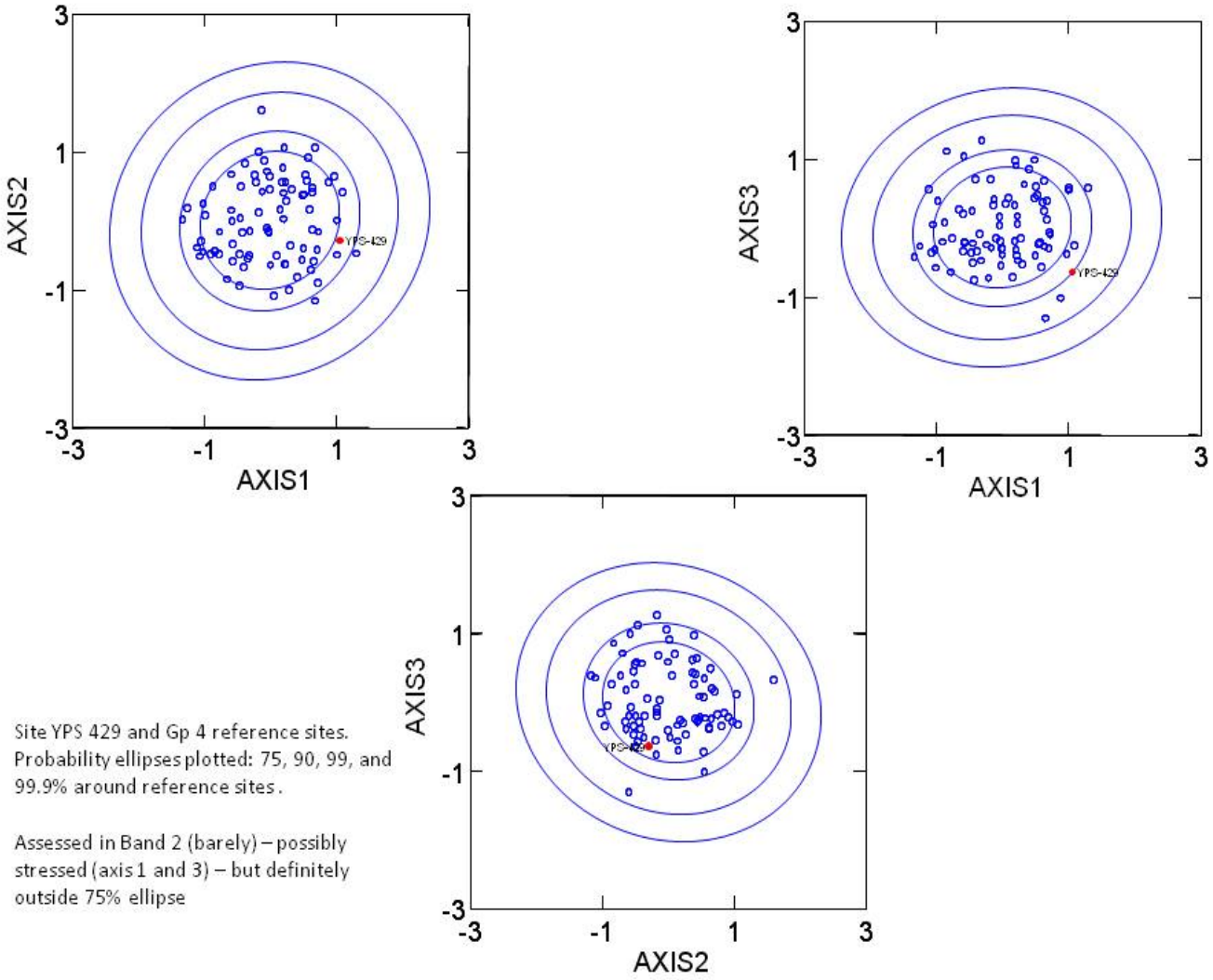
Description	Value
Bray-Curtis Distance	0.49
Bray Curtis Reference Median	2664.38

RIVPACS Analysis

Taxa	Probability of Occurrence	2010 Total Abundance	Mean of Abundance for Reference sites in Group 4	SD of Abundance for Reference sites in Group 4	Benthic Invertebrate Taxa Tolerance	
Chironomidae	0.99	120	802.805	729.921	6	Insensitive
Baetidae	0.81	318	266.355	335.387	4	Insensitive
Simuliidae	0.81	14	196.279	344.165	6	Insensitive
Nemouridae	0.73	46	199.788	481.869	2	Sensitive
Heptageniidae	0.59	2	125.1	224.978	4	Insensitive
Tipulidae	0.54	5	20.236	44.586	3	Insensitive
Sperchonidae	0.51	3	26.463	53.194	8	Tolerant
Empididae	0.45	10	15.69	23.306	6	Insensitive
Limnephilidae	0.4	-	12.781	42.161	4	Insensitive
Lebertiidae	0.39	-	25.081	56.375	8	Tolerant
Chloroperlidae	0.37	-	22.267	65.022	1	Sensitive
Capniidae	0.36	-	38.278	128.73	1	Sensitive
Ephemerellidae	0.31	5	45.387	181.354	1	Sensitive
Perlodidae	0.31	2	10.64	21.321	2	Sensitive
Ameletidae	0.29	-	9.456	27.8	0	Sensitive
Lumbriculidae	0.29	-	47.107	133.253	8	Tolerant
Naididae	0.28	7	14.354	45.061	10	Tolerant
Ceratopogonidae	0.26	1	10.467	30.596	6	Insensitive
Rhyacophilidae	0.22	-	5.978	17.547	0	Sensitive
Psychodidae	0.21	-	4.936	15.808	10	Tolerant
Hydrozetidae	0.17	2	2.975	7.957		
Dytiscidae	0.16	-	4.342	21.087	5	Insensitive
Brachycentridae	0.15	3	12	67.79	1	Sensitive
Hygrobatidae	0.15	-	6.942	19.855	8	Tolerant
Glossosomatidae	0.12	-	2.562	7.672	0	Sensitive
Tubificidae	0.11	-	17.054	100.978	10	Tolerant
Pisidiidae	0.1	-	4.957	28.431	8	Tolerant
Leuctridae	0.09	-	1.033	4.639	0	Sensitive
Valvatidae	0.09	-	8.286	43.046	8	Tolerant
Leptophlebiidae	0.08	-	10.918	44.525	2	Sensitive
Muscidae	0.08	-	0.884	3.454	6	Insensitive
Gammaridae	0.07	-	15.022	67.781	4	Insensitive
Hydropsychidae	0.07	-	1.374	6.206	4	Insensitive
Lymnaeidae	0.06	-	1.02	7.439	6	Insensitive
Hydroptilidae	0.05	-	1.022	6.379	4	Insensitive
Limnesiidae	0.05	-	1.265	7.078		
Physidae	0.05	-	2.39	13.964	8	Tolerant
Corixidae	0.04	-	0.506	4.61		
Dixidae	0.04	-	0.689	4.738	1	Sensitive

Feltriidae	0.04	-	0.536	2.685		
Hyalellidae	0.04	-	0.854	4.15	8	Tolerant
Planorbidae	0.04	-	0.217	1.976	7	Tolerant
Uenoidae	0.04	-	1.819	12.652	0	Sensitive
Aturidae	0.03	-	0.411	1.914		
Torrenticolidae	0.03	-	1.625	12.857		
Curculionidae	0.02	-	0.024	0.22		
Elmidae	0.02	-	0	0	4	Insensitive
Hydrobiidae	0.02	-	0	0	8	Tolerant
Lepidostomatidae	0.02	-	11.596	104.268	3	Insensitive
Perlidae	0.02	-	0.098	0.79	1	Sensitive
Apataniidae	0.01	-	0.748	4.947	1	Sensitive
Culicidae	0.01	-	0	0	8	Tolerant
Deuterophlebiidae	0.01	-	0	0	0	Sensitive
Dolichopodidae	0.01	-	0.063	0.577		
Hydrophilidae	0.01	-	0	0	5	Insensitive
Leptoceridae	0.01	-	0.301	2.744	4	Insensitive
Limnocharidae	0.01	-	0.012	0.11		
Metretopodidae	0.01	-	0.201	1.829		
Mideopsidae	0.01	-	0.151	1.372		
Oribatidae	0.01	-	0.151	1.372		
Oxidae	0.01	-	1.021	8.79		
Pionidae	0.01	-	0.231	1.547		
Planariidae	0.01	-	0.402	3.658	1	Sensitive
Sminthuridae	0.01	-	0	0	10	Tolerant
Staphylinidae	0.01	-	0.05	0.457		
Stratiomyidae	0.01	-	0.099	0.658		
Stygothrombidiidae	0.01	-	0.145	1.317		
Taeniopterygidae	0.01	-	0.057	0.522	2	Sensitive
Isotomidae			0.241	1.985		
Poduridae			0.024	0.22		

Site Assessment Graphs



Site YPS 429 and Gp 4 reference sites.
Probability ellipses plotted: 75, 90, 99, and 99.9% around reference sites.

Assessed in Band 2 (barely) – possibly stressed (axis 1 and 3) – but definitely outside 75% ellipse

Site Assessment Vector Data

Assessment For The Test Site	
Vector 1 Vs Vector 2	Unstressed
Vector 1 Vs Vector 3	Potentially Stressed
Vector 2 Vs Vector 3	Unstressed
Overall	Potentially Stressed

Site Metrics

Metric Name	Test Site	Reference Group Mean	Standard Deviation	Sample Size
Total Abundance	**538**	**2021.304**	**1341.27**	**83**
Total No. of Taxa	**14**	**13.169**	**4.601**	**83**

Site Assessment Report

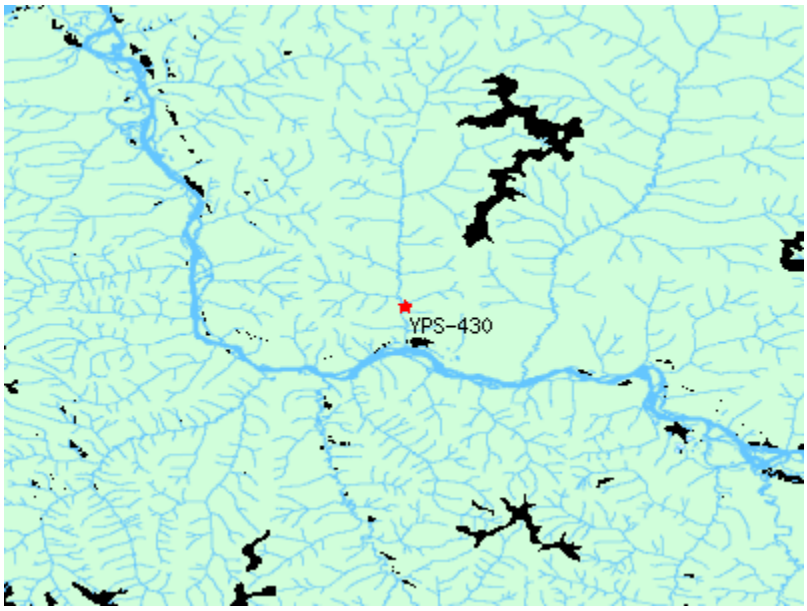
Site Metadata

Site	YPS-430
Sample Date	July 20 2010
Latitude	N 63° 15' 19"
Longitude	W 138° 50' 58"
Altitude	1313
Feature Name	Maisy May Creek
Stream Order	5

Site Photograph

Up Stream

Context Map



BEAST Prediction Results

Predictor Variables	Altitude,Landcover - Alpine,Landcover - Forest,Landcover - Unregen Forest,Landcover - Wetland,Longitude,Precip Rainfall JAN (mm),Precip Snowfall JUN (mm),Stream density (m stream/km2 catchment),Temp Max JAN (deg C)
Predicted Group Number	4

Group	1	2	3	4	5
Probability	21.0%	8.7%	8.8%	61.1%	0.4%

Habitat Attributes

Variable	Site	Reference Group Mean	Standard Deviation	Sample Size
Bedrock Geology - Intrusive (%)	0	6.075	19.14	83
Bedrock Geology - Metamorphic (%)	99.9	12.5	28.727	83
Bedrock Geology - Sedimentary (%)	0	65.324	44.692	83
Bedrock Geology - Sedimentary/Volcanic (%)		3.054	10.333	83
Bedrock Geology - Ultramafic (%)	0.06	1.016	5.484	83
Bedrock Geology - Ultramafic/Metamorphic (%)				83
Bedrock Geology - Unconsolidated (%)	0	2.207	11.231	83
Bedrock Geology - Volcanic (%)	0	3.617	14.321	83
Canopy - % coverage (PercentRange)	1			83
Carbon - dissolved organic (DOC) (mg/L)	12.8			83
Channel Depth - avg (cm)	21.6			83
Channel Depth - max (cm)	37	31.984	28.413	83
Chloride - dissolved (mg/L)	0.5			83
Direct Velocity Measuremen Instrument (Category (1-3))	3			83
Drainage Area (km^2)	158.5	131.84	230.495	83
F (mg/L)	0.13			83
General - Conductivity (uS/cm)	205	230.84	179.366	83
General - dissolved oxygen (DO) (mg/L)	11.87			83
General - pH (pH)	8.1	7.662	0.59	83
General - Specific Conductance (@ 25 C) (uS/cm)	324			83
General - Turbidity (NTU)	20.1			83
Habitats - pools (Binary)	1			83
Habitats - rapids (Binary)	1			83
Habitats - riffles (Binary)	1			83
Habitats - straight run (Binary)	1			83
Hg (ppm)				83
Hg (ng/L)				83
Landcover - Alpine (%)	2.12	27.34	33	83
Landcover - Forest (%)	70.52	19.085	27.643	83
Landcover - Lake (%)	0	0.426	1.585	83
Landcover - Nonprod Forest (%)	22.64	29.604	32.428	83
Landcover - River (%)	0			83
Landcover - Unregen Forest (%)	4.3	1.71	6.039	83
Landcover - Urban (%)	0.42			83
Landcover - Wetland (%)	0	0.352	1.251	83
Macrophyte (PercentRange)	0			83
Nitrogen - ammonia (mg/L)	0.002			83

Nitrogen - nitrate + nitrite (mg/L)	0.123			83
Nitrogen - nitrite (mg/L)	0.002			83
Perimeter - upstream drainage area (Km)	85.4	65.12	49.564	83
Phosphorus - total (mg/L)	0.043			83
Precip Rainfall JAN (mm) (mm)	0.3	0.253	0.647	83
Precip Rainfall JUN (mm) (mm)	42.7	40.631	11.467	83
Precip Rainfall Total ANNUAL (mm) (mm)	200.7	197.4	64.931	83
Precip Snowfall JAN (mm) (mm)	22	18.955	9.044	83
Precip Snowfall JUN (mm) (mm)	0	0.778	1.143	83
Precip Snowfall Total ANNUAL (mm) (mm)	156.9	134.94	45.395	83
Precip Total ANNUAL (mm) (mm)	346.2	321.49	104.112	83
Precip Total JAN (mm) (mm)	20.3	17.705	8.964	83
Precip Total JUN (mm) (mm)	42.5	41.572	11.593	83
Riparian - coniferous trees (Binary)	1			83
Riparian - deciduous trees (Binary)	1			83
Riparian - grasses/ferns (Binary)	1			83
Riparian - shrubs (Binary)	1			83
SO4 (mg/L)	58			83
Slope (m/m)				83
Solids - Total Dissolved (TDS filterable residue) (mg/L)	256			83
Solids - total suspended (TSS) (mg/L)	63			83
Stream density (m stream/km2 catchment) (m/km^2)	942.7	456.44	294.056	83
Stream length (m) in catchment (m)	149385.8	60684	110582.7	83
Substrate - 2nd dominant size category (Category(0-9))	7			83
Substrate - dominant size category (Category(0-9))	5	4.723	2.171	83
Substrate - embeddedness category (Category(1-5))	4	3.831	0.881	83
Substrate - surrounding material size category (Category(0-9))	1			83
Temp Max JAN (deg C) (Degrees Celsius)	-21.8	-21.49	3.258	83
Temp Max JUN (deg C) (Degrees Celsius)	20.9	18.137	2.769	83
Temp Mean JAN (deg C) (Degrees Celsius)	-26.4	-26.28	2.92	83
Temp Mean JUN (deg C) (Degrees Celsius)	13.8	11.572	2.238	83
Temp Min JAN(deg C) (Degrees Celsius)	-31	-31.69	2.875	83
Temp Min JUN (deg C) (Degrees Celsius)	6.8	5.118	1.669	83
Temperature - air (Degrees Celsius)	18			83
Temperature - lake surface or stream (Degrees Celsius)	5.88			83
Velocity (Avg) (m/s)	0.43	0.644	0.886	83
Velocity (Max) (m/s)	0.66			83
Velocity Measurement Method (Category (1-3))	3			83
Width - Bankfull (m)	17.5			83
Width - Wetted (m)	5.2	6.78	5.88	83

Bray-Curtis Analysis

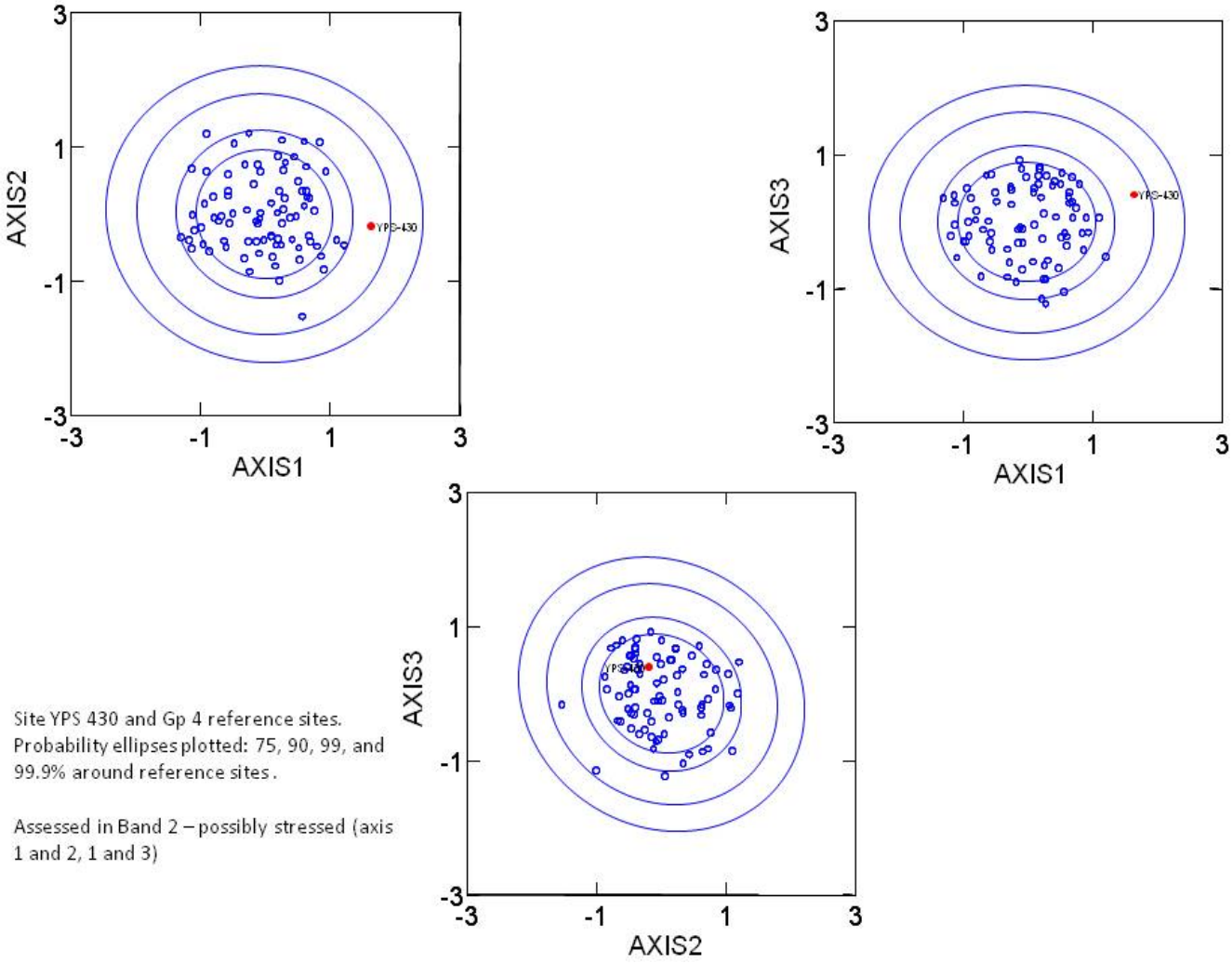
Description	Value
Bray-Curtis Distance	0.59
Bray Curtis Reference Median	2664.38

RIVPACS Analysis

Taxa	Probability of Occurrence	2010 Total Abundance	Mean of Abundance for Reference sites in Group 4	SD of Abundance for Reference sites in Group 4	Benthic Invertebrate Taxa Tolerance	
Chironomidae	0.99	60	802.805	729.921	6	Insensitive
Baetidae	0.84	57	266.355	335.387	4	Insensitive
Simuliidae	0.84	16	196.279	344.165	6	Insensitive
Nemouridae	0.76	1	199.788	481.869	2	Sensitive
Heptageniidae	0.63	40	125.1	224.978	4	Insensitive
Tipulidae	0.55	2	20.236	44.586	3	Insensitive
Sperchonidae	0.53	-	26.463	53.194	8	Tolerant
Empididae	0.48	8	15.69	23.306	6	Insensitive
Limnephilidae	0.42	-	12.781	42.161	4	Insensitive
Lebertiidae	0.4	-	25.081	56.375	8	Tolerant
Chloroperlidae	0.39	8	22.267	65.022	1	Sensitive
Capniidae	0.38	-	38.278	128.73	1	Sensitive
Ephemerellidae	0.32	1	45.387	181.354	1	Sensitive
Perlodidae	0.32	3	10.64	21.321	2	Sensitive
Ameletidae	0.31	-	9.456	27.8	0	Sensitive
Lumbriculidae	0.29	11	47.107	133.253	8	Tolerant
Naididae	0.28	2	14.354	45.061	10	Tolerant
Ceratopogonidae	0.26	-	10.467	30.596	6	Insensitive
Rhyacophilidae	0.24	-	5.978	17.547	0	Sensitive
Psychodidae	0.21	-	4.936	15.808	10	Tolerant
Hydrozetidae	0.18	1	2.975	7.957		
Dytiscidae	0.17	-	4.342	21.087	5	Insensitive
Brachycentridae	0.16	-	12	67.79	1	Sensitive
Hygrobatidae	0.16	-	6.942	19.855	8	Tolerant
Glossosomatidae	0.13	-	2.562	7.672	0	Sensitive
Tubificidae	0.12	-	17.054	100.978	10	Tolerant
Pisidiidae	0.1	-	4.957	28.431	8	Tolerant
Leuctridae	0.09	-	1.033	4.639	0	Sensitive
Muscidae	0.09	-	0.884	3.454	6	Insensitive
Valvatidae	0.09	-	8.286	43.046	8	Tolerant
Leptophlebiidae	0.08	-	10.918	44.525	2	Sensitive
Hydropsychidae	0.07	-	1.374	6.206	4	Insensitive
Gammaridae	0.06	-	15.022	67.781	4	Insensitive
Lymnaeidae	0.06	-	1.02	7.439	6	Insensitive
Hydroptilidae	0.05	-	1.022	6.379	4	Insensitive
Limnesiidae	0.05	-	1.265	7.078		
Uenoidae	0.05	-	1.819	12.652	0	Sensitive
Corixidae	0.04	-	0.506	4.61		
Dixidae	0.04	-	0.689	4.738	1	Sensitive

Feltriidae	0.04	-	0.536	2.685		
Hyalellidae	0.04	-	0.854	4.15	8	Tolerant
Physidae	0.04	-	2.39	13.964	8	Tolerant
Planorbidae	0.04	-	0.217	1.976	7	Tolerant
Aturidae	0.03	-	0.411	1.914		
Torrenticolidae	0.03	-	1.625	12.857		
Apataniidae	0.02	-	0.748	4.947	1	Sensitive
Curculionidae	0.02	-	0.024	0.22		
Lepidostomatidae	0.02	-	11.596	104.268	3	Insensitive
Perlidae	0.02	-	0.098	0.79	1	Sensitive
Pionidae	0.02	-	0.231	1.547		
Culicidae	0.01	-	0	0	8	Tolerant
Deuterophlebiidae	0.01	-	0	0	0	Sensitive
Dolichopodidae	0.01	-	0.063	0.577		
Elmidae	0.01	-	0	0	4	Insensitive
Hydrobiidae	0.01	1	0	0	8	Tolerant
Leptoceridae	0.01	-	0.301	2.744	4	Insensitive
Limnocharidae	0.01	-	0.012	0.11		
Metretopodidae	0.01	-	0.201	1.829		
Mideopsidae	0.01	-	0.151	1.372		
Oribatidae	0.01	-	0.151	1.372		
Oxidae	0.01	-	1.021	8.79		
Peltoperlidae	0.01	-	0	0	2	Sensitive
Planariidae	0.01	-	0.402	3.658	1	Sensitive
Staphylinidae	0.01	-	0.05	0.457		
Stratiomyidae	0.01	-	0.099	0.658		
Stygothrombidiidae	0.01	-	0.145	1.317		
Taeniopterygidae	0.01	-	0.057	0.522	2	Sensitive
Isotomidae			0.241	1.985		
Poduridae			0.024	0.22		

Site Assessment Graphs



Site YPS 430 and Gp 4 reference sites.
Probability ellipses plotted: 75, 90, 99, and 99.9% around reference sites.

Assessed in Band 2 – possibly stressed (axis 1 and 2, 1 and 3)

Site Assessment Vector Data

Assessment For The Test Site	
Vector 1 Vs Vector 2	Potentially Stressed
Vector 1 Vs Vector 3	Potentially Stressed
Vector 2 Vs Vector 3	Unstressed
Overall	Potentially Stressed

Site Metrics

Metric Name	Test Site	Reference Group Mean	Standard Deviation	Sample Size
Total Abundance	**212**	**2021.304**	**1341.27**	**83**
Total No. of Taxa	**15**	**13.169**	**4.601**	**83**

Site Assessment Report

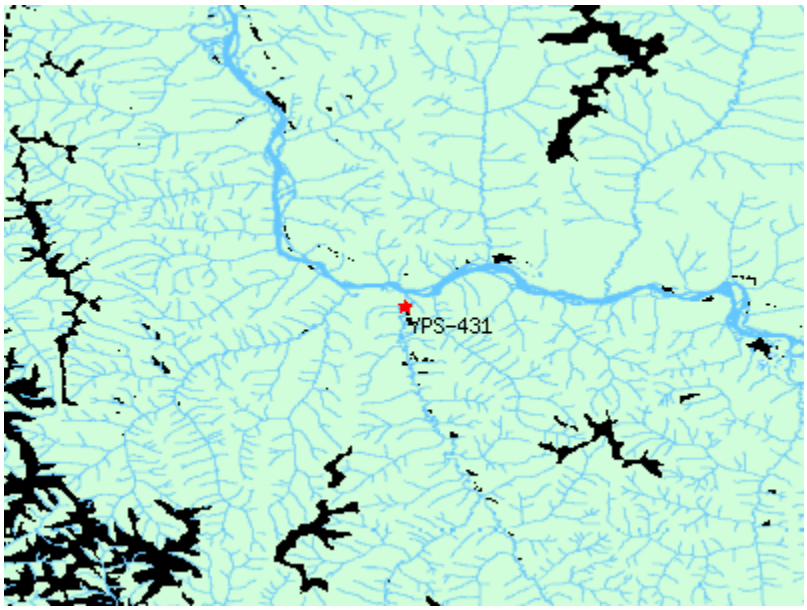
Site Metadata

Site	YPS-431
Sample Date	July 20 2010
Latitude	N 63° 11' 29"
Longitude	W 138° 50' 33"
Altitude	1230
Feature Name	Scroggie Creek
Stream Order	6

Site Photograph

Up Stream

Context Map



BEAST Prediction Results

Predictor Variables	Altitude,Landcover - Alpine,Landcover - Forest,Landcover - Unregen Forest,Landcover - Wetland,Longitude,Precip Rainfall JAN (mm),Precip Snowfall JUN (mm),Stream density (m stream/km2 catchment),Temp Max JAN (deg C)				
Predicted Group Number	4				
Group	**1**	**2**	**3**	**4**	**5**
Probability	9.9%	4.3%	15.1%	70.4%	0.3%

Habitat Attributes

Variable	Site	Reference Group Mean	Standard Deviation	Sample Size
Bedrock Geology - Intrusive (%)	47.5	6.075	19.14	83
Bedrock Geology - Metamorphic (%)	52.5	12.5	28.727	83
Bedrock Geology - Sedimentary (%)	0	65.324	44.692	83
Bedrock Geology - Sedimentary/Volcanic (%)		3.054	10.333	83
Bedrock Geology - Ultramafic (%)	0	1.016	5.484	83
Bedrock Geology - Ultramafic/Metamorphic (%)				83
Bedrock Geology - Unconsolidated (%)	0	2.207	11.231	83
Bedrock Geology - Volcanic (%)	0	3.617	14.321	83
Canopy - % coverage (PercentRange)	1			83
Carbon - dissolved organic (DOC) (mg/L)	18.8			83
Channel Depth - avg (cm)	66			83
Channel Depth - max (cm)	75	31.984	28.413	83
Chloride - dissolved (mg/L)	0.4			83
Direct Velocity Measuremen Instrument (Category (1-3))	3			83
Drainage Area (km^2)	735.1	131.838	230.495	83
F (mg/L)	0.1			83
General - Conductivity (uS/cm)	80	230.84	179.366	83
General - dissolved oxygen (DO) (mg/L)	11.26			83
General - pH (pH)	7.7	7.662	0.59	83
General - Specific Conductance (@ 25 C) (uS/cm)	119			83
General - Turbidity (NTU)	157			83
Habitats - pools (Binary)	1			83
Habitats - rapids (Binary)	1			83
Habitats - riffles (Binary)	1			83
Habitats - straight run (Binary)	1			83
Hg (ppm)				83
Hg (ng/L)				83
Landcover - Alpine (%)	0.16	27.34	33	83
Landcover - Forest (%)	62.31	19.085	27.643	83
Landcover - Lake (%)	0.02	0.426	1.585	83
Landcover - Nonprod Forest (%)	7.68	29.604	32.428	83
Landcover - River (%)	0			83
Landcover - Unregen Forest (%)	29.53	1.71	6.039	83
Landcover - Urban (%)	0.2			83
Landcover - Wetland (%)	0.08	0.352	1.251	83
Macrophyte (PercentRange)	0			83
Nitrogen - ammonia (mg/L)	0.004			83

Nitrogen - nitrate + nitrite (mg/L)	0.183			83
Nitrogen - nitrite (mg/L)	0.005			83
Perimeter - upstream drainage area (Km)	198.4	65.12	49.564	83
Phosphorus - total (mg/L)	0.158			83
Precip Rainfall JAN (mm) (mm)	0.3	0.253	0.647	83
Precip Rainfall JUN (mm) (mm)	42.7	40.631	11.467	83
Precip Rainfall Total ANNUAL (mm) (mm)	200.7	197.402	64.931	83
Precip Snowfall JAN (mm) (mm)	22	18.955	9.044	83
Precip Snowfall JUN (mm) (mm)	0	0.778	1.143	83
Precip Snowfall Total ANNUAL (mm) (mm)	156.9	134.943	45.395	83
Precip Total ANNUAL (mm) (mm)	346.2	321.49	104.112	83
Precip Total JAN (mm) (mm)	20.3	17.705	8.964	83
Precip Total JUN (mm) (mm)	42.5	41.572	11.593	83
Riparian - coniferous trees (Binary)	1			83
Riparian - deciduous trees (Binary)	1			83
Riparian - grasses/ferns (Binary)	1			83
Riparian - shrubs (Binary)	1			83
SO4 (mg/L)	13.7			83
Slope (m/m)				83
Solids - Total Dissolved (TDS filterable residue) (mg/L)	119			83
Solids - total suspended (TSS) (mg/L)	335			83
Stream density (m stream/km2 catchment) (m/km^2)	1310.6	456.436	294.056	83
Stream length (m) in catchment (m)	963327	60684.3	110582.7	83
Substrate - 2nd dominant size category (Category(0-9))	5			83
Substrate - dominant size category (Category(0-9))	7	4.723	2.171	83
Substrate - embeddedness category (Category(1-5))	4	3.831	0.881	83
Substrate - surrounding material size category (Category(0-9))	1			83
Temp Max JAN (deg C) (Degrees Celsius)	-21.8	-21.486	3.258	83
Temp Max JUN (deg C) (Degrees Celsius)	20.9	18.137	2.769	83
Temp Mean JAN (deg C) (Degrees Celsius)	-26.4	-26.277	2.92	83
Temp Mean JUN (deg C) (Degrees Celsius)	13.8	11.572	2.238	83
Temp Min JAN(deg C) (Degrees Celsius)	-31	-31.694	2.875	83
Temp Min JUN (deg C) (Degrees Celsius)	6.8	5.118	1.669	83
Temperature - air (Degrees Celsius)	18			83
Temperature - lake surface or stream (Degrees Celsius)	7.64			83
Velocity (Avg) (m/s)	0.97	0.644	0.886	83
Velocity (Max) (m/s)	1.26			83
Velocity Measurement Method (Category (1-3))	3			83
Width - Bankfull (m)	17.3			83
Width - Wetted (m)	14.3	6.78	5.88	83

Bray-Curtis Analysis

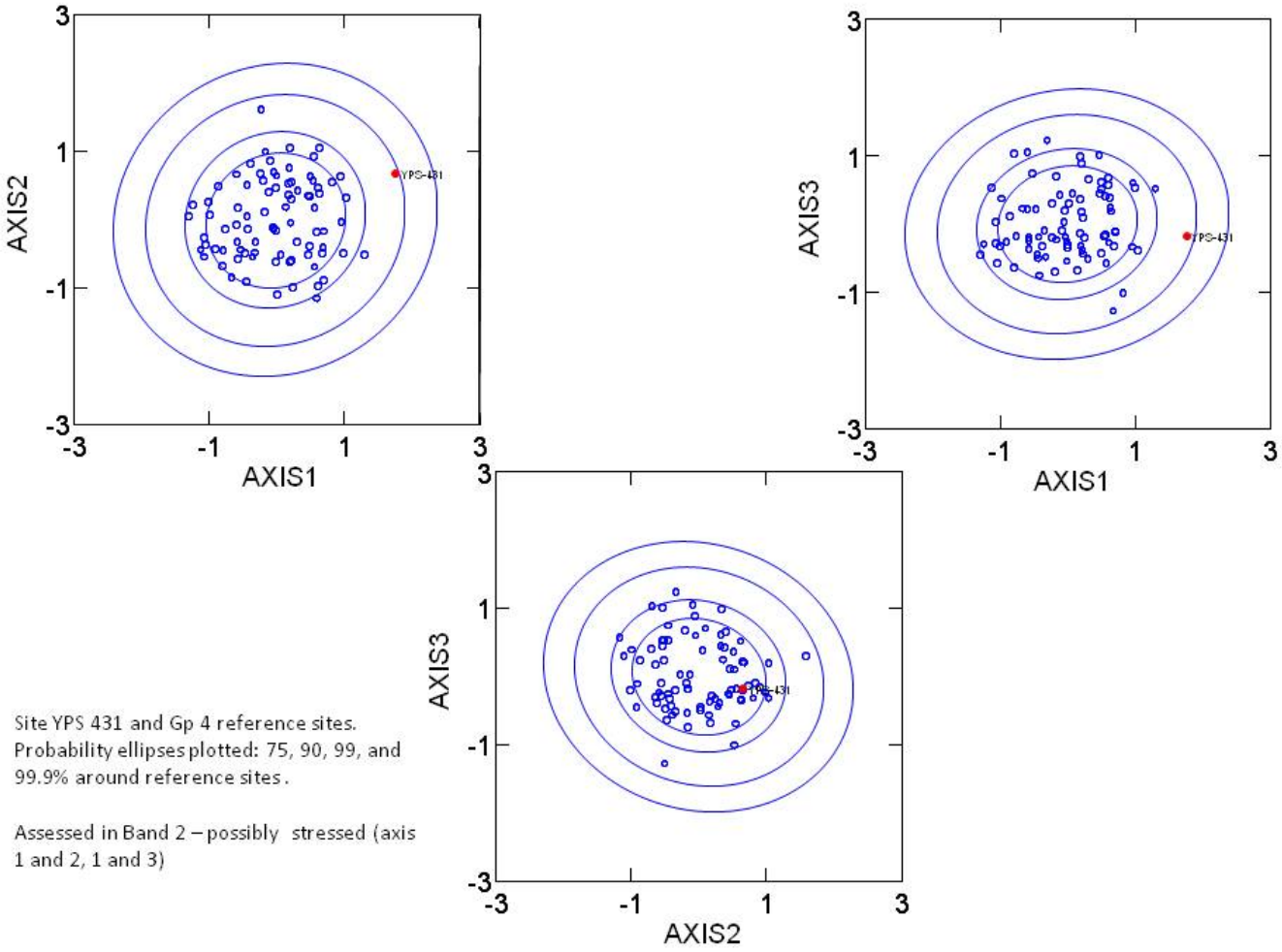
Description	Value
Bray-Curtis Distance	0.66
Bray Curtis Reference Median	2664.38

RIVPACS Analysis

Taxa	Probability of Occurrence	2010 Total Abundance	Mean of Abundance for Reference sites in Group 4	SD of Abundance for Reference sites in Group 4	Benthic Invertebrate Taxa Tolerance	
Chironomidae	0.99	50	802.805	729.921	6	Insensitive
Simuliidae	0.83	6	196.279	344.165	6	Insensitive
Baetidae	0.82	74	266.355	335.387	4	Insensitive
Nemouridae	0.75	-	199.788	481.869	2	Sensitive
Heptageniidae	0.61	1	125.1	224.978	4	Insensitive
Tipulidae	0.55	1	20.236	44.586	3	Insensitive
Sperchonidae	0.53	-	26.463	53.194	8	Tolerant
Empididae	0.48	-	15.69	23.306	6	Insensitive
Lebertiidae	0.43	-	25.081	56.375	8	Tolerant
Limnephilidae	0.4	-	12.781	42.161	4	Insensitive
Capniidae	0.39	-	38.278	128.73	1	Sensitive
Chloroperlidae	0.38	-	22.267	65.022	1	Sensitive
Perlodidae	0.33	-	10.64	21.321	2	Sensitive
Ephemerellidae	0.32	44	45.387	181.354	1	Sensitive
Ameletidae	0.29	-	9.456	27.8	0	Sensitive
Lumbriculidae	0.29	-	47.107	133.253	8	Tolerant
Ceratopogonidae	0.27	-	10.467	30.596	6	Insensitive
Naididae	0.26	-	14.354	45.061	10	Tolerant
Psychodidae	0.23	-	4.936	15.808	10	Tolerant
Rhyacophilidae	0.22	-	5.978	17.547	0	Sensitive
Hydrozetidae	0.2	1	2.975	7.957		
Hygrobatidae	0.18	-	6.942	19.855	8	Tolerant
Dytiscidae	0.16	-	4.342	21.087	5	Insensitive
Brachycentridae	0.15	-	12	67.79	1	Sensitive
Glossosomatidae	0.13	1	2.562	7.672	0	Sensitive
Tubificidae	0.13	4	17.054	100.978	10	Tolerant
Pisidiidae	0.1	-	4.957	28.431	8	Tolerant
Leptophlebiidae	0.09	-	10.918	44.525	2	Sensitive
Leuctridae	0.09	-	1.033	4.639	0	Sensitive
Muscidae	0.09	-	0.884	3.454	6	Insensitive
Valvatidae	0.09	-	8.286	43.046	8	Tolerant
Gammaridae	0.07	-	15.022	67.781	4	Insensitive
Hydropsychidae	0.07	-	1.374	6.206	4	Insensitive
Lymnaeidae	0.06	-	1.02	7.439	6	Insensitive
Limnesiidae	0.05	-	1.265	7.078		
Physidae	0.05	-	2.39	13.964	8	Tolerant
Feltriidae	0.04	-	0.536	2.685		
Hyalellidae	0.04	-	0.854	4.15	8	Tolerant
Hydroptilidae	0.04	-	1.022	6.379	4	Insensitive

Planorbidae	0.04	-	0.217	1.976	7	Tolerant
Uenoidae	0.04	-	1.819	12.652	0	Sensitive
Aturidae	0.03	-	0.411	1.914		
Corixidae	0.03	-	0.506	4.61		
Dixidae	0.03	-	0.689	4.738	1	Sensitive
Torrenticolidae	0.03	-	1.625	12.857		
Apataniidae	0.02	-	0.748	4.947	1	Sensitive
Curculionidae	0.02	-	0.024	0.22		
Hydrobiidae	0.02	-	0	0	8	Tolerant
Lepidostomatidae	0.02	-	11.596	104.268	3	Insensitive
Oxidae	0.02	-	1.021	8.79		
Perlidae	0.02	-	0.098	0.79	1	Sensitive
Pionidae	0.02	-	0.231	1.547		
Stratiomyidae	0.02	-	0.099	0.658		
Culicidae	0.01	-	0	0	8	Tolerant
Deuterophlebiidae	0.01	-	0	0	0	Sensitive
Dolichopodidae	0.01	-	0.063	0.577		
Elmidae	0.01	-	0	0	4	Insensitive
Hydrophilidae	0.01	-	0	0	5	Insensitive
Hydryphantidae	0.01	-	0	0		
Leptoceridae	0.01	-	0.301	2.744	4	Insensitive
Limnocharidae	0.01	-	0.012	0.11		
Metretopodidae	0.01	-	0.201	1.829		
Mideopsidae	0.01	-	0.151	1.372		
Oribatidae	0.01	-	0.151	1.372		
Planariidae	0.01	-	0.402	3.658	1	Sensitive
Scathophagidae	0.01	-	0	0		
Sminthuridae	0.01	-	0	0	10	Tolerant
Staphylinidae	0.01	-	0.05	0.457		
Stygothrombidiidae	0.01	-	0.145	1.317		
Taeniopterygidae	0.01	-	0.057	0.522	2	Sensitive
Isotomidae			0.241	1.985		
Poduridae			0.024	0.22		

Site Assessment Graphs



Site YPS 431 and Gp 4 reference sites.
Probability ellipses plotted: 75, 90, 99, and 99.9% around reference sites.

Assessed in Band 2 – possibly stressed (axis 1 and 2, 1 and 3)

Site Assessment Vector Data

Assessment For The Test Site	
Vector 1 Vs Vector 2	Potentially Stressed
Vector 1 Vs Vector 3	Potentially Stressed
Vector 2 Vs Vector 3	Unstressed
Overall	Potentially Stressed

Site Metrics

Metric Name	Test Site	Reference Group Mean	Standard Deviation	Sample Size
Total Abundance	**182**	**2021.304**	**1341.27**	**83**
Total No. of Taxa	**9**	**13.169**	**4.601**	**83**

Site Assessment Report

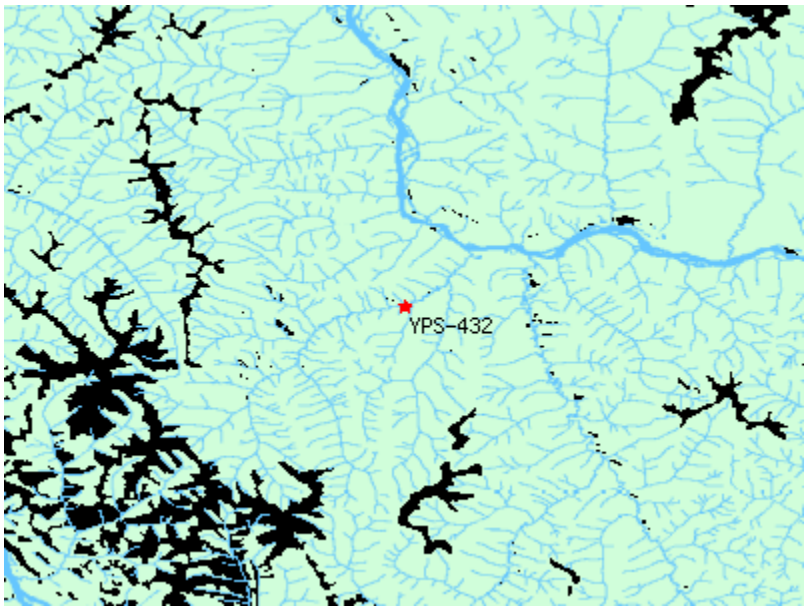
Site Metadata

Site	YPS-432
Sample Date	July 20 2010
Latitude	N 63° 8' 14"
Longitude	W 138° 54' 25"
Altitude	1364
Feature Name	Barker Creek
Stream Order	5

Site Photograph

Up Stream

Context Map



BEAST Prediction Results

Predictor Variables	Altitude,Landcover - Alpine,Landcover - Forest,Landcover - Unregen Forest,Landcover - Wetland,Longitude,Precip Rainfall JAN (mm),Precip Snowfall JUN (mm),Stream density (m stream/km2 catchment),Temp Max JAN (deg C)				
Predicted Group Number	4				
Group	**1**	**2**	**3**	**4**	**5**
Probability	2.7%	1.2%	0.9%	95.0%	0.2%

Habitat Attributes

Variable	Site	Reference Group Mean	Standard Deviation	Sample Size
Bedrock Geology - Intrusive (%)	0.13	6.075	19.14	83
Bedrock Geology - Metamorphic (%)	99.87	12.5	28.727	83
Bedrock Geology - Sedimentary (%)	0	65.324	44.692	83
Bedrock Geology - Sedimentary/Volcanic (%)		3.054	10.333	83
Bedrock Geology - Ultramafic (%)	0	1.016	5.484	83
Bedrock Geology - Ultramafic/Metamorphic (%)				83
Bedrock Geology - Unconsolidated (%)	0	2.207	11.231	83
Bedrock Geology - Volcanic (%)	0	3.617	14.321	83
Canopy - % coverage (PercentRange)	1			83
Carbon - dissolved organic (DOC) (mg/L)	20.1			83
Channel Depth - avg (cm)	38.4			83
Channel Depth - max (cm)	43	31.984	28.413	83
Chloride - dissolved (mg/L)	0.9			83
Direct Velocity Measuremen Instrument (Category (1-3))	3			83
Drainage Area (km^2)	154.2	131.838	230.495	83
F (mg/L)	0.08			83
General - Conductivity (uS/cm)	120	230.84	179.366	83
General - dissolved oxygen (DO) (mg/L)	11.72			83
General - pH (pH)	7.9	7.662	0.59	83
General - Specific Conductance (@ 25 C) (uS/cm)	182			83
General - Turbidity (NTU)	314			83
Habitats - pools (Binary)	1			83
Habitats - rapids (Binary)	0			83
Habitats - riffles (Binary)	1			83
Habitats - straight run (Binary)	1			83
Hg (ppm)				83
Hg (ng/L)				83
Landcover - Alpine (%)	0	27.34	33	83
Landcover - Forest (%)	68.06	19.085	27.643	83
Landcover - Lake (%)	0	0.426	1.585	83
Landcover - Nonprod Forest (%)	30.17	29.604	32.428	83
Landcover - River (%)	0			83
Landcover - Unregen Forest (%)	1.48	1.71	6.039	83
Landcover - Urban (%)	0.28			83
Landcover - Wetland (%)	0	0.352	1.251	83
Macrophyte (PercentRange)	0			83
Nitrogen - ammonia (mg/L)	0.011			83

Nitrogen - nitrate + nitrite (mg/L)	0.442			83
Nitrogen - nitrite (mg/L)	0.005			83
Perimeter - upstream drainage area (Km)	84.4	65.12	49.564	83
Phosphorus - total (mg/L)	0.148			83
Precip Rainfall JAN (mm) (mm)	0.3	0.253	0.647	83
Precip Rainfall JUN (mm) (mm)	42.7	40.631	11.467	83
Precip Rainfall Total ANNUAL (mm) (mm)	200.7	197.402	64.931	83
Precip Snowfall JAN (mm) (mm)	22	18.955	9.044	83
Precip Snowfall JUN (mm) (mm)	0	0.778	1.143	83
Precip Snowfall Total ANNUAL (mm) (mm)	156.9	134.943	45.395	83
Precip Total ANNUAL (mm) (mm)	346.2	321.49	104.112	83
Precip Total JAN (mm) (mm)	20.3	17.705	8.964	83
Precip Total JUN (mm) (mm)	42.5	41.572	11.593	83
Riparian - coniferous trees (Binary)	0			83
Riparian - deciduous trees (Binary)	1			83
Riparian - grasses/ferns (Binary)	1			83
Riparian - shrubs (Binary)	1			83
SO4 (mg/L)	22.8			83
Slope (m/m)				83
Solids - Total Dissolved (TDS filterable residue) (mg/L)	183			83
Solids - total suspended (TSS) (mg/L)	327			83
Stream density (m stream/km2 catchment) (m/km^2)	1429.9	456.436	294.056	83
Stream length (m) in catchment (m)	220422	60684.26	110582.7	83
Substrate - 2nd dominant size category (Category(0-9))	7			83
Substrate - dominant size category (Category(0-9))	5	4.723	2.171	83
Substrate - embeddedness category (Category(1-5))	4	3.831	0.881	83
Substrate - surrounding material size category (Category(0-9))	1			83
Temp Max JAN (deg C) (Degrees Celsius)	-21.8	-21.486	3.258	83
Temp Max JUN (deg C) (Degrees Celsius)	20.9	18.137	2.769	83
Temp Mean JAN (deg C) (Degrees Celsius)	-26.4	-26.277	2.92	83
Temp Mean JUN (deg C) (Degrees Celsius)	13.8	11.572	2.238	83
Temp Min JAN(deg C) (Degrees Celsius)	-31	-31.694	2.875	83
Temp Min JUN (deg C) (Degrees Celsius)	6.8	5.118	1.669	83
Temperature - air (Degrees Celsius)	20			83
Temperature - lake surface or stream (Degrees Celsius)	7.11			83
Velocity (Avg) (m/s)	0.58	0.644	0.886	83
Velocity (Max) (m/s)	0.73			83
Velocity Measurement Method (Category (1-3))	3			83
Width - Bankfull (m)				83
Width - Wetted (m)	7.8	6.78	5.88	83

Bray-Curtis Analysis

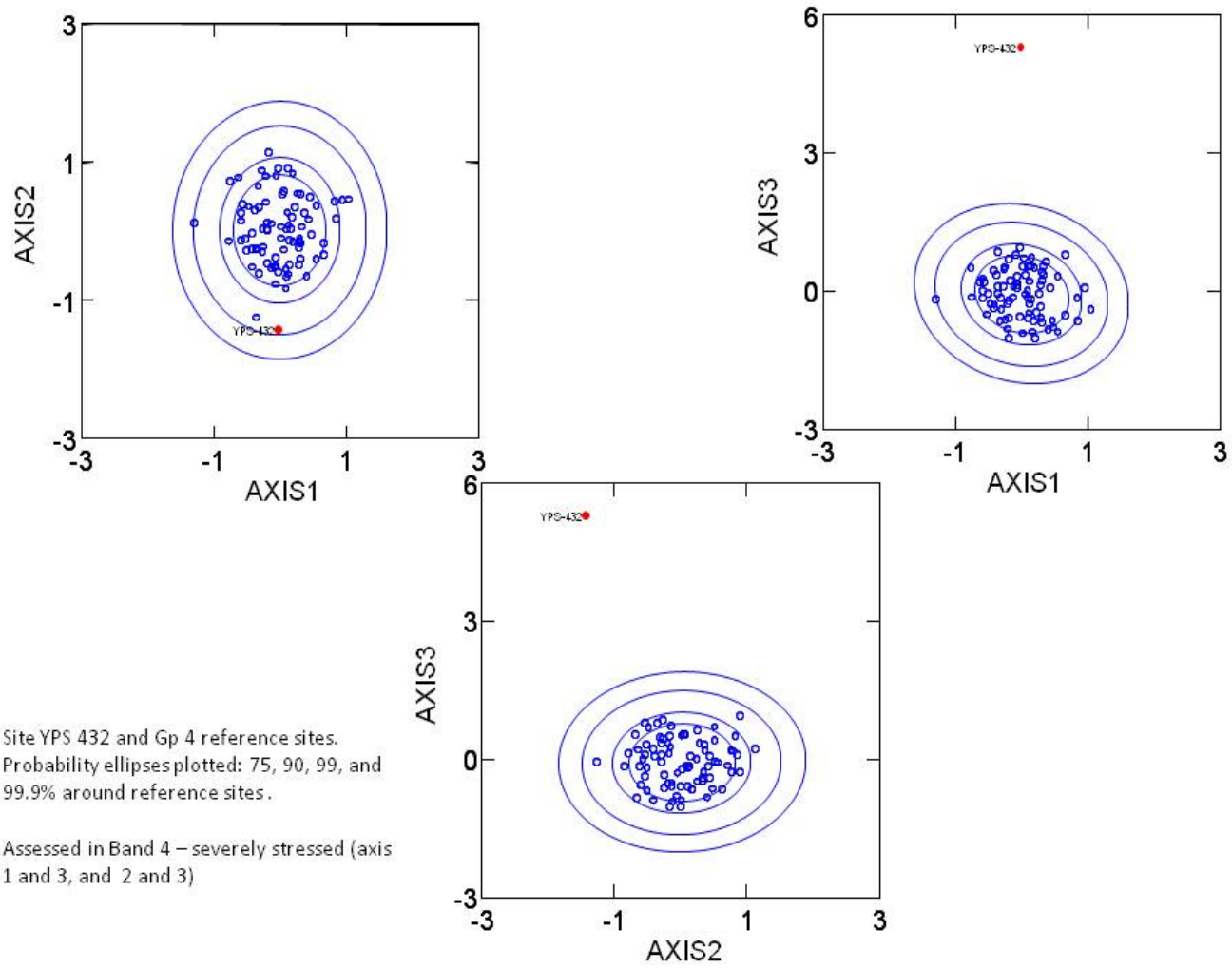
Description	Value
Bray-Curtis Distance	0.71
Bray Curtis Reference Median	2664.38

RIVPACS Analysis

Taxa	Probability of Occurrence	2010 Total Abundance	Mean of Abundance for Reference sites in Group 4	SD of Abundance for Reference sites in Group 4	Benthic Invertebrate Taxa Tolerance	
Chironomidae	1	6	802.805	729.921	6	Insensitive
Simuliidae	0.93	3	196.279	344.165	6	Insensitive
Baetidae	0.92	1	266.355	335.387	4	Insensitive
Nemouridae	0.82	3	199.788	481.869	2	Sensitive
Heptageniidae	0.71	-	125.1	224.978	4	Insensitive
Tipulidae	0.61	-	20.236	44.586	3	Insensitive
Sperchonidae	0.6	1	26.463	53.194	8	Tolerant
Empididae	0.58	-	15.69	23.306	6	Insensitive
Lebertiidae	0.52	-	25.081	56.375	8	Tolerant
Capniidae	0.47	-	38.278	128.73	1	Sensitive
Limnephilidae	0.43	-	12.781	42.161	4	Insensitive
Chloroperlidae	0.42	-	22.267	65.022	1	Sensitive
Perlodidae	0.38	-	10.64	21.321	2	Sensitive
Ephemerellidae	0.34	-	45.387	181.354	1	Sensitive
Ameletidae	0.33	-	9.456	27.8	0	Sensitive
Lumbriculidae	0.31	-	47.107	133.253	8	Tolerant
Ceratopogonidae	0.27	-	10.467	30.596	6	Insensitive
Hydrozetidae	0.26	-	2.975	7.957		
Psychodidae	0.24	-	4.936	15.808	10	Tolerant
Rhyacophilidae	0.24	-	5.978	17.547	0	Sensitive
Hygrobatidae	0.23	-	6.942	19.855	8	Tolerant
Naididae	0.22	-	14.354	45.061	10	Tolerant
Brachycentridae	0.18	-	12	67.79	1	Sensitive
Dytiscidae	0.18	-	4.342	21.087	5	Insensitive
Tubificidae	0.17	-	17.054	100.978	10	Tolerant
Glossosomatidae	0.15	-	2.562	7.672	0	Sensitive
Muscidae	0.12	-	0.884	3.454	6	Insensitive
Valvatidae	0.11	-	8.286	43.046	8	Tolerant
Leptophlebiidae	0.09	-	10.918	44.525	2	Sensitive
Gammaridae	0.08	-	15.022	67.781	4	Insensitive
Leuctridae	0.08	-	1.033	4.639	0	Sensitive
Pisidiidae	0.08	-	4.957	28.431	8	Tolerant
Hydropsychidae	0.07	-	1.374	6.206	4	Insensitive
Limnesiidae	0.07	-	1.265	7.078		
Feltriidae	0.06	-	0.536	2.685		
Physidae	0.06	-	2.39	13.964	8	Tolerant
Aturidae	0.05	-	0.411	1.914		
Hyalellidae	0.05	-	0.854	4.15	8	Tolerant
Torrenticolidae	0.05	-	1.625	12.857		

Uenoidae	0.05	-	1.819	12.652	0	Sensitive
Dixidae	0.04	-	0.689	4.738	1	Sensitive
Hydroptilidae	0.04	-	1.022	6.379	4	Insensitive
Lymnaeidae	0.04	-	1.02	7.439	6	Insensitive
Apataniidae	0.02	-	0.748	4.947	1	Sensitive
Corixidae	0.02	-	0.506	4.61		
Lepidostomatidae	0.02	-	11.596	104.268	3	Insensitive
Oxidae	0.02	-	1.021	8.79		
Perlidae	0.02	-	0.098	0.79	1	Sensitive
Pionidae	0.02	-	0.231	1.547		
Planorbidae	0.02	-	0.217	1.976	7	Tolerant
Stratiomyidae	0.02	-	0.099	0.658		
Curculionidae	0.01	-	0.024	0.22		
Dolichopodidae	0.01	-	0.063	0.577		
Leptoceridae	0.01	-	0.301	2.744	4	Insensitive
Limnocharidae	0.01	-	0.012	0.11		
Metretopodidae	0.01	-	0.201	1.829		
Mideopsidae	0.01	-	0.151	1.372		
Oribatidae	0.01	-	0.151	1.372		
Planariidae	0.01	-	0.402	3.658	1	Sensitive
Staphylinidae	0.01	-	0.05	0.457		
Stygothrombidiidae	0.01	-	0.145	1.317		
Taeniopterygidae	0.01	-	0.057	0.522	2	Sensitive
Isotomidae			0.241	1.985		
Poduridae			0.024	0.22		

Site Assessment Graphs



Site YPS 432 and Gp 4 reference sites.
Probability ellipses plotted: 75, 90, 99, and 99.9% around reference sites.

Assessed in Band 4 – severely stressed (axis 1 and 3, and 2 and 3)

Site Assessment Vector Data

Assessment For The Test Site	
Vector 1 Vs Vector 2	Potentially Stressed
Vector 1 Vs Vector 3	Severely Stressed
Vector 2 Vs Vector 3	Severely Stressed
Overall	Severely Stressed

Site Metrics

Metric Name	Test Site	Reference Group Mean	Standard Deviation	Sample Size
Total Abundance	**15**	**2021.304**	**1341.27**	**83**
Total No. of Taxa	**6**	**13.169**	**4.601**	**83**

Site Assessment Report

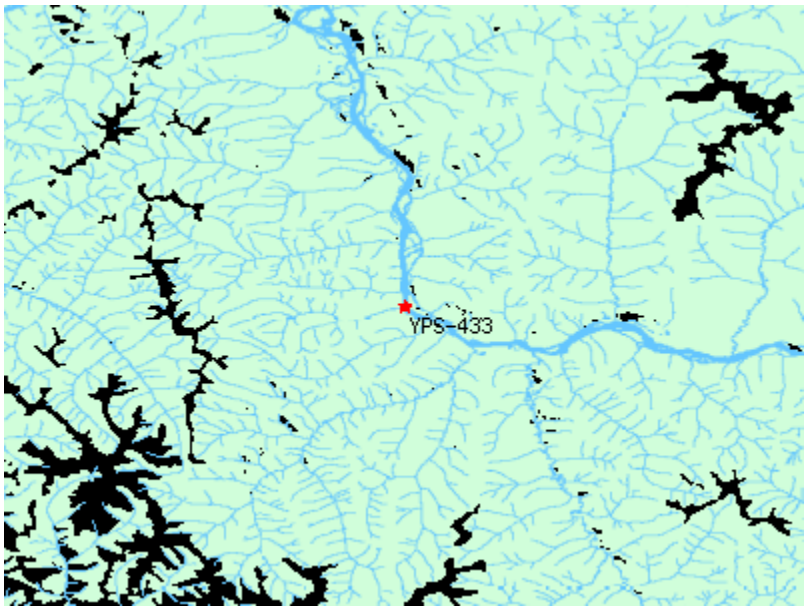
Site Metadata

Site	YPS-433
Sample Date	July 20 2010
Latitude	N 63° 10' 54"
Longitude	W 138° 59' 35"
Altitude	1301
Feature Name	Brewer Creek
Stream Order	4

Site Photograph

Up Stream

Context Map



BEAST Prediction Results

Predictor Variables	Altitude,Landcover - Alpine,Landcover - Forest,Landcover - Unregen Forest,Landcover - Wetland,Longitude,Precip Rainfall JAN (mm),Precip Snowfall JUN (mm),Stream density (m stream/km2 catchment),Temp Max JAN (deg C)
Predicted Group Number	4

Group	1	2	3	4	5
Probability	6.1%	2.4%	1.7%	89.6%	0.2%

Habitat Attributes

Variable	Site	Reference Group Mean	Standard Deviation	Sample Size
Bedrock Geology - Intrusive (%)	0	6.075	19.14	83
Bedrock Geology - Metamorphic (%)	100	12.5	28.727	83
Bedrock Geology - Sedimentary (%)	0	65.324	44.692	83
Bedrock Geology - Sedimentary/Volcanic (%)		3.054	10.333	83
Bedrock Geology - Ultramafic (%)	0	1.016	5.484	83
Bedrock Geology - Ultramafic/Metamorphic (%)				83
Bedrock Geology - Unconsolidated (%)	0	2.207	11.231	83
Bedrock Geology - Volcanic (%)	0	3.617	14.321	83
Canopy - % coverage (PercentRange)	2			83
Carbon - dissolved organic (DOC) (mg/L)	20.1			83
Channel Depth - avg (cm)	20.4			83
Channel Depth - max (cm)	23	31.984	28.413	83
Chloride - dissolved (mg/L)	0.6			83
Direct Velocity Measuremen Instrument (Category (1-3))	3			83
Drainage Area (km^2)	28.2	131.838	230.495	83
F (mg/L)	0.11			83
General - Conductivity (uS/cm)	120	230.84	179.366	83
General - dissolved oxygen (DO) (mg/L)	11.77			83
General - pH (pH)	7.9	7.662	0.59	83
General - Specific Conductance (@ 25 C) (uS/cm)	179			83
General - Turbidity (NTU)	55.4			83
Habitats - pools (Binary)	1			83
Habitats - rapids (Binary)	1			83
Habitats - riffles (Binary)	1			83
Habitats - straight run (Binary)	1			83
Hg (ppm)				83
Hg (ng/L)				83
Landcover - Alpine (%)	0	27.34	33	83
Landcover - Forest (%)	83.92	19.085	27.643	83
Landcover - Lake (%)	0	0.426	1.585	83
Landcover - Nonprod Forest (%)	16.08	29.604	32.428	83
Landcover - River (%)	0			83
Landcover - Unregen Forest (%)	0	1.71	6.039	83
Landcover - Urban (%)	0			83
Landcover - Wetland (%)	0	0.352	1.251	83
Macrophyte (PercentRange)	0			83
Nitrogen - ammonia (mg/L)	0.013			83

Nitrogen - nitrate + nitrite (mg/L)	0.234			83
Nitrogen - nitrite (mg/L)	0.005			83
Perimeter - upstream drainage area (Km)	31.6	65.12	49.564	83
Phosphorus - total (mg/L)	0.101			83
Precip Rainfall JAN (mm) (mm)	0.3	0.253	0.647	83
Precip Rainfall JUN (mm) (mm)	42.7	40.631	11.467	83
Precip Rainfall Total ANNUAL (mm) (mm)	200.7	197.402	64.931	83
Precip Snowfall JAN (mm) (mm)	22	18.955	9.044	83
Precip Snowfall JUN (mm) (mm)	0	0.778	1.143	83
Precip Snowfall Total ANNUAL (mm) (mm)	156.9	134.943	45.395	83
Precip Total ANNUAL (mm) (mm)	346.2	321.49	104.112	83
Precip Total JAN (mm) (mm)	20.3	17.705	8.964	83
Precip Total JUN (mm) (mm)	42.5	41.572	11.593	83
Riparian - coniferous trees (Binary)	1			83
Riparian - deciduous trees (Binary)	1			83
Riparian - grasses/ferns (Binary)	1			83
Riparian - shrubs (Binary)	1			83
SO4 (mg/L)	31			83
Slope (m/m)				83
Solids - Total Dissolved (TDS filterable residue) (mg/L)	165			83
Solids - total suspended (TSS) (mg/L)	152			83
Stream density (m stream/km2 catchment) (m/km^2)	1354.6	456.436	294.056	83
Stream length (m) in catchment (m)	38153.2	60684.3	110582.7	83
Substrate - 2nd dominant size category (Category(0-9))	1			83
Substrate - dominant size category (Category(0-9))	7	4.723	2.171	83
Substrate - embeddedness category (Category(1-5))	4	3.831	0.881	83
Substrate - surrounding material size category (Category(0-9))	1			83
Temp Max JAN (deg C) (Degrees Celsius)	-21.8	-21.486	3.258	83
Temp Max JUN (deg C) (Degrees Celsius)	20.9	18.137	2.769	83
Temp Mean JAN (deg C) (Degrees Celsius)	-26.4	-26.277	2.92	83
Temp Mean JUN (deg C) (Degrees Celsius)	13.8	11.572	2.238	83
Temp Min JAN(deg C) (Degrees Celsius)	-31	-31.694	2.875	83
Temp Min JUN (deg C) (Degrees Celsius)	6.8	5.118	1.669	83
Temperature - air (Degrees Celsius)	20			83
Temperature - lake surface or stream (Degrees Celsius)	7.67			83
Velocity (Avg) (m/s)	0.46	0.644	0.886	83
Velocity (Max) (m/s)	0.62			83
Velocity Measurement Method (Category (1-3))	3			83
Width - Bankfull (m)	3.3			83
Width - Wetted (m)	3.3	6.78	5.88	83

Bray-Curtis Analysis

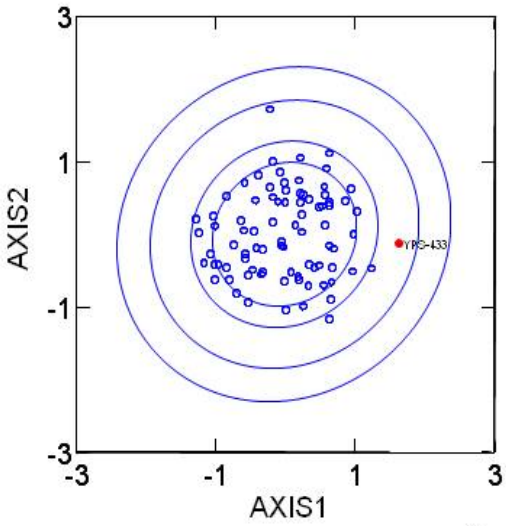
Description	Value
Bray-Curtis Distance	0.75
Bray Curtis Reference Median	2664.38

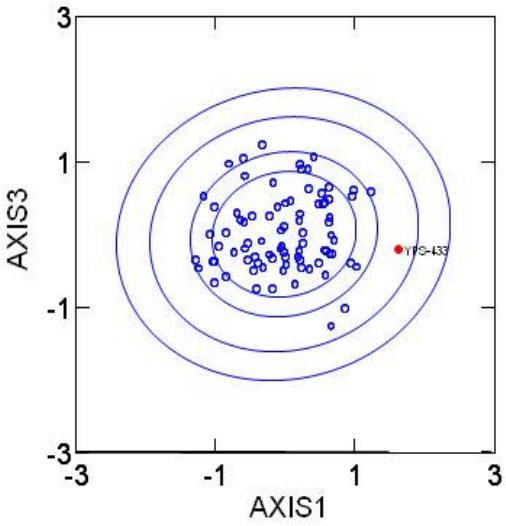
RIVPACS Analysis

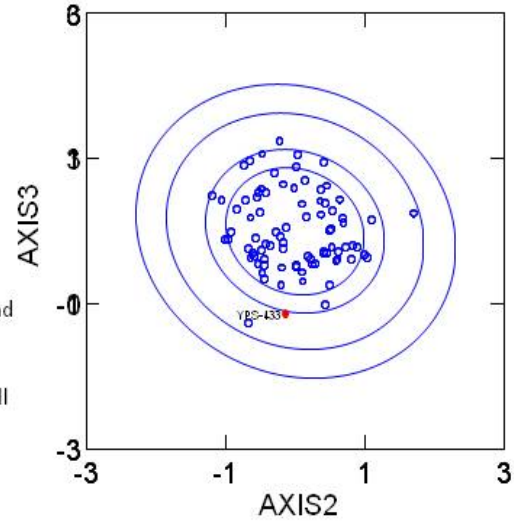
Taxa	Probability of Occurrence	2010 Total Abundance	Mean of Abundance for Reference sites in Group 4	SD of Abundance for Reference sites in Group 4	Benthic Invertebrate Taxa Tolerance	
Chironomidae	1	30	802.805	729.921	6	Insensitive
Simuliidae	0.92	16	196.279	344.165	6	Insensitive
Baetidae	0.91	120	266.355	335.387	4	Insensitive
Nemouridae	0.81	50	199.788	481.869	2	Sensitive
Heptageniidae	0.7	1	125.1	224.978	4	Insensitive
Tipulidae	0.6	-	20.236	44.586	3	Insensitive
Sperchonidae	0.59	-	26.463	53.194	8	Tolerant
Empididae	0.56	-	15.69	23.306	6	Insensitive
Lebertiidae	0.5	-	25.081	56.375	8	Tolerant
Capniidae	0.45	6	38.278	128.73	1	Sensitive
Limnephilidae	0.43	-	12.781	42.161	4	Insensitive
Chloroperlidae	0.41	-	22.267	65.022	1	Sensitive
Perlodidae	0.37	-	10.64	21.321	2	Sensitive
Ameletidae	0.33	-	9.456	27.8	0	Sensitive
Ephemerellidae	0.33	-	45.387	181.354	1	Sensitive
Lumbriculidae	0.31	-	47.107	133.253	8	Tolerant
Ceratopogonidae	0.27	-	10.467	30.596	6	Insensitive
Hydrozetidae	0.25	-	2.975	7.957		
Rhyacophilidae	0.24	-	5.978	17.547	0	Sensitive
Naididae	0.23	-	14.354	45.061	10	Tolerant
Psychodidae	0.23	-	4.936	15.808	10	Tolerant
Hygrobatidae	0.22	-	6.942	19.855	8	Tolerant
Dytiscidae	0.18	-	4.342	21.087	5	Insensitive
Brachycentridae	0.17	-	12	67.79	1	Sensitive
Tubificidae	0.16	-	17.054	100.978	10	Tolerant
Glossosomatidae	0.15	-	2.562	7.672	0	Sensitive
Muscidae	0.11	-	0.884	3.454	6	Insensitive
Valvatidae	0.1	-	8.286	43.046	8	Tolerant
Leptophlebiidae	0.09	-	10.918	44.525	2	Sensitive
Leuctridae	0.09	-	1.033	4.639	0	Sensitive
Pisidiidae	0.09	-	4.957	28.431	8	Tolerant
Gammaridae	0.08	-	15.022	67.781	4	Insensitive
Hydropsychidae	0.07	-	1.374	6.206	4	Insensitive
Limnesiidae	0.07	-	1.265	7.078		
Physidae	0.06	-	2.39	13.964	8	Tolerant
Feltriidae	0.05	-	0.536	2.685		
Hyalellidae	0.05	-	0.854	4.15	8	Tolerant
Uenoidae	0.05	-	1.819	12.652	0	Sensitive
Aturidae	0.04	-	0.411	1.914		

Dixidae	0.04	-	0.689	4.738	1	Sensitive
Hydroptilidae	0.04	-	1.022	6.379	4	Insensitive
Lymnaeidae	0.04	-	1.02	7.439	6	Insensitive
Torrenticolidae	0.04	-	1.625	12.857		
Apataniidae	0.02	-	0.748	4.947	1	Sensitive
Corixidae	0.02	-	0.506	4.61		
Lepidostomatidae	0.02	-	11.596	104.268	3	Insensitive
Oxidae	0.02	-	1.021	8.79		
Perlidae	0.02	-	0.098	0.79	1	Sensitive
Pionidae	0.02	-	0.231	1.547		
Planorbidae	0.02	-	0.217	1.976	7	Tolerant
Stratiomyidae	0.02	-	0.099	0.658		
Curculionidae	0.01	-	0.024	0.22		
Dolichopodidae	0.01	-	0.063	0.577		
Leptoceridae	0.01	-	0.301	2.744	4	Insensitive
Limnocharidae	0.01	-	0.012	0.11		
Metretopodidae	0.01	-	0.201	1.829		
Mideopsidae	0.01	-	0.151	1.372		
Oribatidae	0.01	-	0.151	1.372		
Planariidae	0.01	-	0.402	3.658	1	Sensitive
Staphylinidae	0.01	-	0.05	0.457		
Stygothrombidiidae	0.01	-	0.145	1.317		
Taeniopterygidae	0.01	-	0.057	0.522	2	Sensitive
Isotomidae			0.241	1.985		
Poduridae			0.024	0.22		

Site Assessment Graphs







Site YPS 433 and Gp 4 reference sites.
Probability ellipses plotted: 75, 90, 99, and 99.9% around reference sites.

Assessed in Band 2 – possibly stressed (all axes)

Site Assessment Vector Data

Assessment For The Test Site	
Vector 1 Vs Vector 2	Potentially Stressed
Vector 1 Vs Vector 3	Potentially Stressed
Vector 2 Vs Vector 3	Unstressed
Overall	Potentially Stressed

Site Metrics

Metric Name	Test Site	Reference Group Mean	Standard Deviation	Sample Size
Total Abundance	**223**	**2021.304**	**1341.27**	**83**
Total No. of Taxa	**6**	**13.169**	**4.601**	**83**

Site Assessment Report

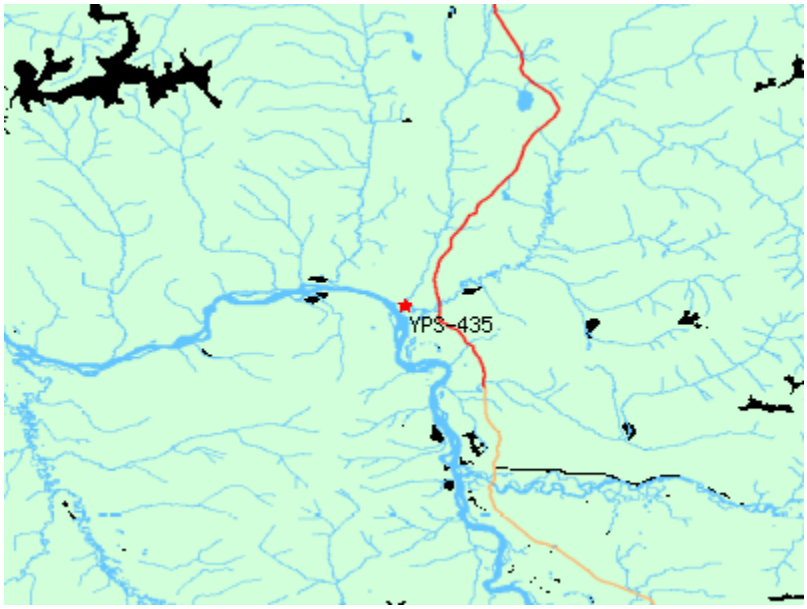
Site Metadata

Site	YPS-435
Sample Date	July 21 2010
Latitude	N 63° 37' 1"
Longitude	W 137° 38' 12"
Altitude	1417
Feature Name	Clear Creek
Stream Order	4

Site Photograph

Up Stream

Context Map



BEAST Prediction Results

Predictor Variables	Altitude,Landcover - Alpine,Landcover - Forest,Landcover - Unregen Forest,Landcover - Wetland,Longitude,Precip Rainfall JAN (mm),Precip Snowfall JUN (mm),Stream density (m stream/km2 catchment),Temp Max JAN (deg C)
Predicted Group Number	3

Group	**1**	**2**	**3**	**4**	**5**
Probability	26.2%	15.1%	41.1%	17.1%	0.5%

Habitat Attributes

Variable	Site	Reference Group Mean	Standard Deviation	Sample Size
Bedrock Geology - Intrusive (%)	21.08	0	0	22
Bedrock Geology - Metamorphic (%)	0	18.182	39.477	22
Bedrock Geology - Sedimentary (%)	65.23	65.841	46.487	22
Bedrock Geology - Sedimentary/Volcanic (%)		2.341	6.662	22
Bedrock Geology - Ultramafic (%)	0	0	0	22
Bedrock Geology - Ultramafic/Metamorphic (%)				22
Bedrock Geology - Unconsolidated (%)	13.69	4.901	18.987	22
Bedrock Geology - Volcanic (%)	0	0	0	22
Canopy - % coverage (PercentRange)	1			22
Carbon - dissolved organic (DOC) (mg/L)	6.5			22
Channel Depth - avg (cm)	54			22
Channel Depth - max (cm)	102	44.429	46.135	22
Chloride - dissolved (mg/L)	0.3			22
Direct Velocity Measuremen Instrument (Category (1-3))	3			22
Drainage Area (km^2)	578.1	90.478	97.773	22
F (mg/L)	0.17			22
General - Conductivity (uS/cm)	109	308.395	191.122	22
General - dissolved oxygen (DO) (mg/L)	10.16			22
General - pH (pH)	8	7.466	0.652	22
General - Specific Conductance (@ 25 C) (uS/cm)	141			22
General - Turbidity (NTU)	1.99			22
Habitats - pools (Binary)	1			22
Habitats - rapids (Binary)	0			22
Habitats - riffles (Binary)	1			22
Habitats - straight run (Binary)	1			22
Hg (ppm)				22
Hg (ng/L)				22
Landcover - Alpine (%)	5.63	20.196	33.232	22
Landcover - Forest (%)	56.43	29.136	35.311	22
Landcover - Lake (%)	0.04	0.804	2.782	22
Landcover - Nonprod Forest (%)	11.6	28.23	32.868	22
Landcover - River (%)	0			22
Landcover - Unregen Forest (%)	25.06	11.243	18.488	22
Landcover - Urban (%)	0.44			22
Landcover - Wetland (%)	0.81	4.57	13.452	22
Macrophyte (PercentRange)	0			22
Nitrogen - ammonia (mg/L)	0.002			22

Nitrogen - nitrate + nitrite (mg/L)	0.005			22
Nitrogen - nitrite (mg/L)	0.001			22
Perimeter - upstream drainage area (Km)	169.3	53.873	33.301	22
Phosphorus - total (mg/L)	0.004			22
Precip Rainfall JAN (mm) (mm)	0.3	0.241	0.467	22
Precip Rainfall JUN (mm) (mm)	60.7	36.614	4.796	22
Precip Rainfall Total ANNUAL (mm) (mm)	26.5	175.691	35.386	22
Precip Snowfall JAN (mm) (mm)	26.5	18.491	6.142	22
Precip Snowfall JUN (mm) (mm)	0.1	0.459	0.594	22
Precip Snowfall Total ANNUAL (mm) (mm)	254.5	124.618	19.724	22
Precip Total ANNUAL (mm) (mm)	395.3	294.614	47.351	22
Precip Total JAN (mm) (mm)	21.6	17.195	6.62	22
Precip Total JUN (mm) (mm)	60.9	37.25	4.719	22
Riparian - coniferous trees (Binary)	1			22
Riparian - deciduous trees (Binary)	1			22
Riparian - grasses/ferns (Binary)	1			22
Riparian - shrubs (Binary)	1			22
Slope (m/m)	0.005			22
SO4 (mg/L)	17.4			22
Solids - Total Dissolved (TDS filterable residue) (mg/L)	113			22
Solids - total suspended (TSS) (mg/L)	2.5			22
Stream density (m stream/km2 catchment) (m/km^2)	683.4	284.354	70.483	22
Stream length (m) in catchment (m)	395131	27751.9	30857.25	22
Substrate - 2nd dominant size category (Category(0-9))	3			22
Substrate - dominant size category (Category(0-9))	5	3.864	2.315	22
Substrate - embeddedness category (Category(1-5))	3	3.455	1.143	22
Substrate - surrounding material size category (Category(0-9))	1			22
Temp Max JAN (deg C) (Degrees Celsius)	-21.2	-21.145	4.344	22
Temp Max JUN (deg C) (Degrees Celsius)	21.3	18.65	1.552	22
Temp Mean JAN (deg C) (Degrees Celsius)	-25.7	-26.191	4.132	22
Temp Mean JUN (deg C) (Degrees Celsius)	14.7	11.773	1.16	22
Temp Min JAN(deg C) (Degrees Celsius)	-30.3	-31.864	4.089	22
Temp Min JUN (deg C) (Degrees Celsius)	8.1	4.814	1.001	22
Temperature - air (Degrees Celsius)	24			22
Temperature - lake surface or stream (Degrees Celsius)	13			22
Velocity (Avg) (m/s)	0.64	0.35	0.231	22
Velocity (Max) (m/s)	0.78			22
Velocity Measurement Method (Category (1-3))	3			22
Width - Bankfull (m)	18.2			22
Width - Wetted (m)	11.6	5.355	4.746	22

Bray-Curtis Analysis

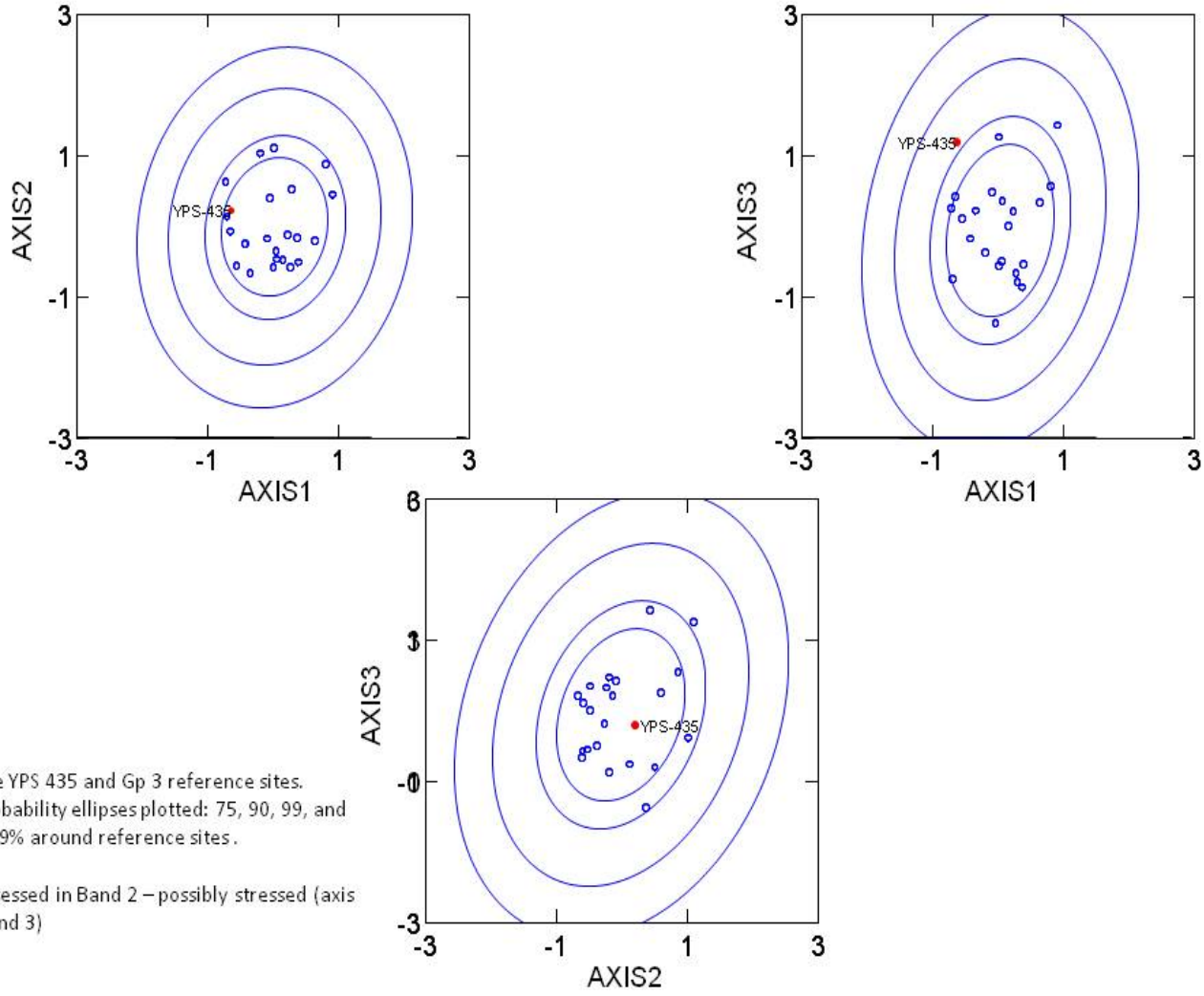
Description	Value
Bray-Curtis Distance	0.59
Bray Curtis Reference Median	274.5

RIVPACS Analysis

Taxa	Probability of Occurrence	2010 Total Abundance	Mean of Abundance for Reference sites in Group 3	SD of Abundance for Reference sites in Group 3	Benthic Invertebrate Taxa Tolerance	
Chironomidae	0.96	86	14.286	11.892	6	Insensitive
Baetidae	0.64	78	2.864	7.649	4	Insensitive
Simuliidae	0.64	-	1.591	3.172	6	Insensitive
Nemouridae	0.6	-	1.227	2.562	2	Sensitive
Tipulidae	0.44	13	1.091	2.328	3	Insensitive
Heptageniidae	0.42	4	0.182	0.588	4	Insensitive
Sperchonidae	0.39	12	1.045	3.078	8	Tolerant
Limnephilidae	0.34	1	0.591	1.709	4	Insensitive
Naididae	0.33	-	2.591	6.17	10	Tolerant
Chloroperlidae	0.31	4	0.727	1.907	1	Sensitive
Ephemerellidae	0.29	7	0.727	1.579	1	Sensitive
Empididae	0.28	43	0	0	6	Insensitive
Ceratopogonidae	0.26	25	0.864	2.145	6	Insensitive
Lumbriculidae	0.25	-	1.682	4.156	8	Tolerant
Lebertiidae	0.24	21	0.227	0.528	8	Tolerant
Perlodidae	0.23	1	0.182	0.501	2	Sensitive
Ameletidae	0.22	40	0.045	0.213	0	Sensitive
Capniidae	0.22	-	0.182	0.664	1	Sensitive
Psychodidae	0.2	9	0.591	1.501	10	Tolerant
Rhyacophilidae	0.19	3	0.045	0.213	0	Sensitive
Dytiscidae	0.13	3	0.091	0.294	5	Insensitive
Brachycentridae	0.11	-	0.182	0.853	1	Sensitive
Pisidiidae	0.11	-	4	13.053	8	Tolerant
Lymnaeidae	0.1	-	0.182	0.501	6	Insensitive
Leuctridae	0.09	-	0.091	0.294	0	Sensitive
Glossosomatidae	0.08	4	0	0	0	Sensitive
Planorbidae	0.08	-	0.273	0.767	7	Tolerant
Corixidae	0.07	-	0.136	0.468		
Hydropsychidae	0.07	-	0.045	0.213	4	Insensitive
Hydrozetidae	0.06	-	0	0		
Hygrobatidae	0.06	36	0	0	8	Tolerant
Leptophlebiidae	0.06	-	0.091	0.426	2	Sensitive
Hydrobiidae	0.05	-	0.318	1.129	8	Tolerant
Hydroptilidae	0.05	1	0.045	0.213	4	Insensitive
Tubificidae	0.05	-	0.091	0.426	10	Tolerant
Valvatidae	0.05	-	0	0	8	Tolerant
Culicidae	0.04	-	0.091	0.294	8	Tolerant
Gammaridae	0.04	-	4.955	23.239	4	Insensitive
Muscidae	0.04	-	0	0	6	Insensitive
Uenoidae	0.04	-	0	0	0	Sensitive
Curculionidae	0.03	-	0.045	0.213		
Dixidae	0.03	-	0	0	1	Sensitive
Elmidae	0.03	-	1.909	8.954	4	Insensitive

Hyalellidae	0.03	-	0	0	8	Tolerant
Physidae	0.03	-	0.182	0.853	8	Tolerant
Scathophagidae	0.03	-	0.045	0.213		
Deuterophlebiidae	0.02	-	0	0	0	Sensitive
Hydrophilidae	0.02	-	0.182	0.853	5	Insensitive
Hydryphantidae	0.02	-	0.045	0.213		
Limnesiidae	0.02	-	0	0		
Sminthuridae	0.02	-	0.045	0.213	10	Tolerant
Athericidae	0.01	-	0	0		
Aturidae	0.01	-	0	0		
Caenidae	0.01	-	0	0	7	Tolerant
Feltriidae	0.01	-	0	0		
Glossiphoniidae	0.01	-	0	0	8	Tolerant
Hydraenidae	0.01	-	0	0	5	Insensitive
Lepidostomatidae	0.01	-	0	0	3	Insensitive
Leptoceridae	0.01	-	0	0	4	Insensitive
Metretopodidae	0.01	-	0	0		
Peltoperlidae	0.01	-	0	0	2	Sensitive
Perlidae	0.01	-	0	0	1	Sensitive
Planariidae	0.01	-	0	0	1	Sensitive
Taeniopterygidae	0.01	-	0	0	2	Sensitive
Torrenticolidae	0.01	-	0	0		
Isotomidae			0.091	0.294		
Poduridae			0.409	1.919		

Site Assessment Graphs



Site YPS 435 and Gp 3 reference sites.
Probability ellipses plotted: 75, 90, 99, and 99.9% around reference sites.

Assessed in Band 2 – possibly stressed (axis 1 and 3)

Site Assessment Vector Data

Assessment For The Test Site	
Vector 1 Vs Vector 2	Unstressed
Vector 1 Vs Vector 3	Potentially Stressed
Vector 2 Vs Vector 3	Unstressed
Overall	Potentially Stressed

Site Metrics

Metric Name	Test Site	Reference Group Mean	Standard Deviation	Sample Size
Total Abundance	**393**	**44.227**	**43.526**	**22**
Total No. of Taxa	**21**	**6.364**	**3.593**	**22**