



**Fish Habitat Management System  
for Yukon Placer Mining**

**Aquatic Health Monitoring Report (2008)**

*Prepared by*

**The Yukon Placer  
Aquatic Health Working Group**

**June 2009**

## AQUATIC HEALTH MONITORING REPORT (2008)

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 158 reference sites collected over the period 2004 to 2007 by the University of Western Ontario, Fisheries and Oceans Canada, and the Yukon Territorial 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 four community groups being defined for reference sites in the Yukon River basin. There are 53 sites in Group 1, 45 sites in Group 2, 20 sites in Group 3 and 40 sites in Group 4. The following is a summary of the general characteristics of each group.

*Community 1:* Intermediate abundance, chironomids are less dominant, this is a mayfly (Baetidae and Heptageniidae) dominated community but stoneflies (Nemouridae) and Simuliidae are also abundant. These are streams in the eastern Yukon with lower rainfall but higher snowfall; the catchments also have a higher percentage of alpine habitat.

*Community 2:* These are sites of intermediate abundance, but the community is dominated by chironomids which represent more than 50% of the community. These sites have the lowest amount of alpine land cover in the catchments and have deeper stream channels.

*Community 3:* These sites represent a very depauperate community, almost entirely chironomids and the lowest overall family richness. These are more western sites, with lower snowfall but higher rainfall; again they tend to have deeper channels.

*Community 4:* This is the most abundant community with 10 times more organisms per sample than communities 1 and 2. Chironomids are again the most common family, however the Baetidae are also very common. These streams tend to be in the western part of the Yukon. They have the highest rainfall and the greatest proportion of alpine land cover in their catchments.

Data from the same 158 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.

It should be noted that with the exception of water use licenses issued after April 11, 2008, the new fish habitat management system did not result in reduced sediment discharge standards or stricter site management practices in 2008. Consequently, the aquatic health monitoring results for 2008 are an assessment of the *status quo*, as opposed to the beneficial influence of the new rules for Yukon placer mining.

Thirty-nine sites were sampled under the aquatic health monitoring program in 2008. Twenty-two were sampled as potential reference sites, and 17 were test sites. The new reference sites were chosen to improve the distribution of reference sites across the Yukon. It is highly probable that these sites and reference sites sampled in 2009 will be incorporated into an improved Yukon River Basin RCA model that will be applied to test sites sampled in 2009.

Of the test sites sampled in 2008, 14 were new and three 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**

| <b>Site Code<br/>(year of<br/>sampling)</b> | <b>Group<br/>(probability<br/>of belonging<br/>to group)</b> | <b>Watershed</b> | <b>Watercourse</b> | <b>RCA Model Results<br/>for Benthic<br/>macroinvertebrates</b> | <b>** Model Results<br/>for Fish Species<br/>Diversity</b> | <b>Reason for Benthic<br/>macroinvertebrate Results</b>  |
|---|--|------------------|--------------------|---|--|--|
| YPS-078.1<br>(2006)                         | Group 2<br>(44.1%)   | Klondike River   | Hunker Creek       | stressed  | * not in reference<br>condition                            | 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<br>(2008)                         | Group 2<br>(41.4%)   | Klondike River   | Hunker Creek       | potentially stressed  | severely 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-081.1<br>(2006)                         | Group 2<br>(42.7%)   | Klondike River   | Bonanza Creek      | potentially stressed  | * not in reference<br>condition                            | Two families with a high probability of occurrence were found in numbers that exceed the mean of Group 2 reference sites.  |
| YPS-081.2<br>(2008)                         | Group 2<br>(41.2%)   | Klondike River   | Bonanza Creek      | stressed  | unstressed   | 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-107.1<br>(2006)                         | Group 2<br>(41.5%)   | Klondike River   | Eldorado Creek     | severely stressed   | * in reference<br>condition                                | Three families with a high probability of occurrence were found in greater numbers than the mean of Group 2 reference sites. One family with a 66% probability of occurrence was more abundant by an order of magnitude, while one with a 47% probability of occurrence was found in numbers almost two orders of magnitude greater than the mean. |

| Site Code<br>(year of<br>sampling) | Group<br>(probability<br>of belonging<br>to group) | Watershed      | Watercourse     | RCA Model Results<br>for Benthic<br>macroinvertebrates | ** Model Results<br>for Fish Species<br>Diversity | Reason for Benthic<br>macroinvertebrate Results  |
|------------------------------------|--|----------------|-----------------|--|---|--|
| YPS-107.2<br>(2008)                | Group 2<br>(40.0%)                                 | Klondike River | Eldorado Creek  | potentially stressed                                   | unstressed  | One family with a 99% probability of occurrence was less abundant than the mean of Group 2 reference sites. Two other taxa with a high probability of occurrence were found in numbers that exceed the mean.                                       |
| YPS-314<br>(2008)                  | Group 1<br>(99.4%)                                 | White River    | Cyr Creek       | potentially stressed                                   | severely stressed                                 | The abundance of one family with a 96% probability of occurrence is an order of magnitude greater than the mean for Group 1 reference sites. Four other families with a high probability of occurrence were found in numbers that exceed the mean. |
| YPS-315<br>(2008)                  | Group 3<br>(53.7%)                                 | White River    | Gladstone Creek | stressed   | unstressed  | The total number of families exceeded the mean of Group 3 reference sites. In addition, several families were present in numbers that exceed the group mean by one to three orders of magnitude.   |
| YPS-316<br>(2008)                  | Group 2<br>(42.8%)                                 | White River    | Nansen Creek    | stressed   | unstressed  | Some families were found in numbers that exceed the mean of Group 2 reference sites, and some were found in numbers below the group mean. One family that had a 65% probability of occurrence was not present during sampling.                     |
| YPS-317<br>(2008)                  | Group 2<br>(43.1%)                                 | White River    | Victoria Creek  | severely stressed                                      | potentially stressed                              | Two families were found in numbers that exceed the mean for Group 2 by an order of magnitude. One family that had a 65% probability of occurrence was not present during sampling.   |
| YPS-319<br>(2008)                  | Group 4<br>(58.4%)                                 | White River    | Nisling River   | unstressed   | unstressed  | The total number of families exceeded the mean of Group 4 reference sites by a slight margin. The families with a high probability of occurrence were all present in expected  |

| Site Code<br>(year of<br>sampling) | Group<br>(probability<br>of belonging<br>to group) | Watershed        | Watercourse       | RCA Model Results<br>for Benthic<br>macroinvertebrates | ** Model Results<br>for Fish Species<br>Diversity | Reason for Benthic<br>macroinvertebrate Results   |
|------------------------------------|--|------------------|-------------------|--|---|---|
| YPS-319<br>(2008)                  | Group 4<br>(58.4%)                                 |                  |                   |  |   | numbers, with one exception. While this family was not observed despite a 69% probability of occurrence, its absence falls within the mean of Group 4 sites.  |
| YPS-321<br>(2008)                  | Group 4<br>(70.1%)                                 | White River      | Nansen Creek      | potentially stressed                                   | unstressed  | Three families with a high probability of occurrence were observed in numbers that exceed the mean of Group 4 reference sites by a slight margin.   |
| YPS-322<br>(2008)                  | Group 4<br>(77.5%)                                 | White River      | Victoria Creek    | unstressed   | unstressed  | The total number of families and all families with a high probability of occurrence were observed in numbers that fall within the mean of Group 4 reference sites.  |
| YPS-323<br>(2008)                  | Group 4<br>(72.1%)                                 | White River      | Klaza River       | unstressed   | unstressed  | Same as above.  |
| YPS-325<br>(2008)                  | Group 4<br>(92.0%)                                 | Big Salmon River | Livingstone Creek | unstressed   | severely stressed                                 | Same as above.  |
| YPS-326<br>(2008)                  | Group 4<br>(47.5%)                                 | Big Salmon River | Martin Creek      | unstressed   | severely stressed                                 | With one exception, the total number of families and all families with a high probability of occurrence were observed in numbers that fall within the mean of Group 4 sites. One family with a 65% probability of occurrence was found in numbers that exceed the mean. |
| YPS-344<br>(2008)                  | Group 2<br>(41.9%)                                 | Klondike River   | Bonanza Creek     | stressed   | unstressed  | The dominant family for Group 2 reference sites was found in numbers below the group mean.  |
| YPS-347<br>(2008)                  | Group 4<br>(58.1%)                                 | Stewart River    | Clear Creek       | unstressed   | potentially stressed                              | The total number of families exceeded the mean of Group 4 reference sites by a slight margin. The families with a high probability of occurrence were all present in expected   |

| Site Code<br>(year of<br>sampling) | Group<br>(probability<br>of belonging<br>to group) | Watershed        | Watercourse            | RCA Model Results<br>for Benthic<br>macroinvertebrates | ** Model Results<br>for Fish Species<br>Diversity | Reason for Benthic<br>macroinvertebrate Results   |
|------------------------------------|--|------------------|------------------------|--|---|---|
| YPS-347<br>(2008)                  | Group 4<br>(58.1%)                                 |                  |                        |  |   | numbers, with one exception. One family with a 69% probability of occurrence was found in numbers that exceed the mean.   |
| YPS-348<br>(2008)                  | Group 1<br>(50.3%)                                 | Stewart River    | Clear Creek            | unstressed   | unstressed  | The total number of families exceeded the mean of Group 1 reference sites by a slight margin. The families with a high probability of occurrence were all present in expected numbers, with one exception. One family with a 78% probability of occurrence was found in numbers that exceed the mean. |
| YPS-372<br>(2008)                  | Group 4<br>(93.5%)                                 | Big Salmon River | Cottoneva Creek        | potentially stressed                                   | stressed  | Total abundance of aquatic invertebrates observed was 123, while the mean for Group 4 reference sites is 2053.1. Unfortunately, the standard deviation for total abundance was not available at the time of reporting.  |
| YPS-373<br>(2008)                  | Group 1<br>(48.3%)                                 | Big Salmon River | South Big Salmon River | unstressed   | unstressed  | The total number of families exceeded the mean of Group 1 reference sites by a slight margin. Four of the five families most likely to be observed were present in numbers that exceed the mean of Group 1 sites, but the predominance of two taxa is consistent with the Group 1 community.          |

Note: YPS-078.1, YPS-081.1 and YPS-107.1 were sampled in 2006. YPS-078.2, YPS-081.2 and YPS-107.2 were re-assessments of the same sites in 2008.

\* The likely degree of stress for sites that were determined to be out of reference condition was not reported upon when these results were analyzed in 2006.

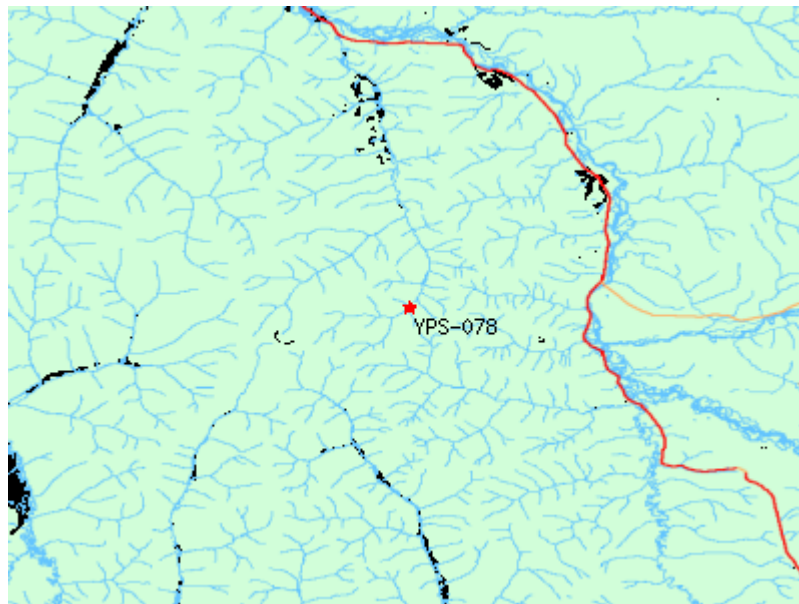
\*\*The presence or absence of fish during any short term sampling event is not a reliable indicator of aquatic health. For this reason far more weight is assigned to the results of the benthic macro invertebrate (BMI) analysis. The fish species diversity results have been included for the purpose of establishing a baseline and detecting long term trends.

## Site Assessment Report

### Site Metadata

|                     |                                      |
|---------------------|--------------------------------------|
| <b>Site</b>         | YPS-078.1                            |
| <b>Sample Date</b>  | Jul 08 2006                          |
| <b>Latitude</b>     | N 63° 55' 21"                        |
| <b>Longitude</b>    | W 138° 53' 2"                        |
| <b>Altitude</b>     |                                      |
| <b>Feature Name</b> | Hunker Creek upstream of Ontario Cr. |
| <b>Stream Order</b> | 3                                    |

### Context Map



### BEAST Prediction Results

|                               |  |          |          |          |
|-------------------------------|--|----------|----------|----------|
| <b>Predictor Variables</b>    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |          |          |          |
| <b>Predicted Group Number</b> | 2  |          |          |          |
| <b>Group</b>                  | <b>1</b>   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>Probability</b>            | 14.5%  | 44.1%    | 29.1%    | 12.3%    |



**Habitat Attributes**

| Variable   | Site      | Reference Group Mean | Standard Deviation | Sample Size |
|--|-----------|----------------------|--------------------|-------------|
| Channel Depth - avg (cm)                               | 20.4      | 37.2                 | 18.58941           | 12          |
| General - pH (pH)                                      | 7.1       | 7.7                  | 0.808761           | 45          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 460       | 228                  | 134.161            | 44          |
| Landcover – Alpine (%)                                 | 0         | 25.414               | 0.219036           | 45          |
| Landcover – Lake (%)                                   | 0         | 0.727                | 0.014997           | 45          |
| Precip Rainfall JUN (mm) (mm)                          | 37        | 37.441               | 7.555326           | 45          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 114.8     | 129.697              | 19.21532           | 45          |
| Solids - total suspended (TSS) (mg/L)                  | 5.0000000 | 100.1723077          | 30.64302           | 37          |
| Substrate - embeddedness category (Category(1-5))      | 5         | 4                    | 0.778499           | 12          |
| Temperature - lake surface or stream (Degrees Celsius) | 6.8       | 9.4281646            | 3.98499            | 45          |
| Velocity (Avg) (m/s)                                   | 0.51      | 0.45                 | 0.227003           | 45          |
| Width - Wetted (m)                                     | 2.5       | 5.6                  | 3.792933           | 45          |

**Bray-Curtis Analysis**

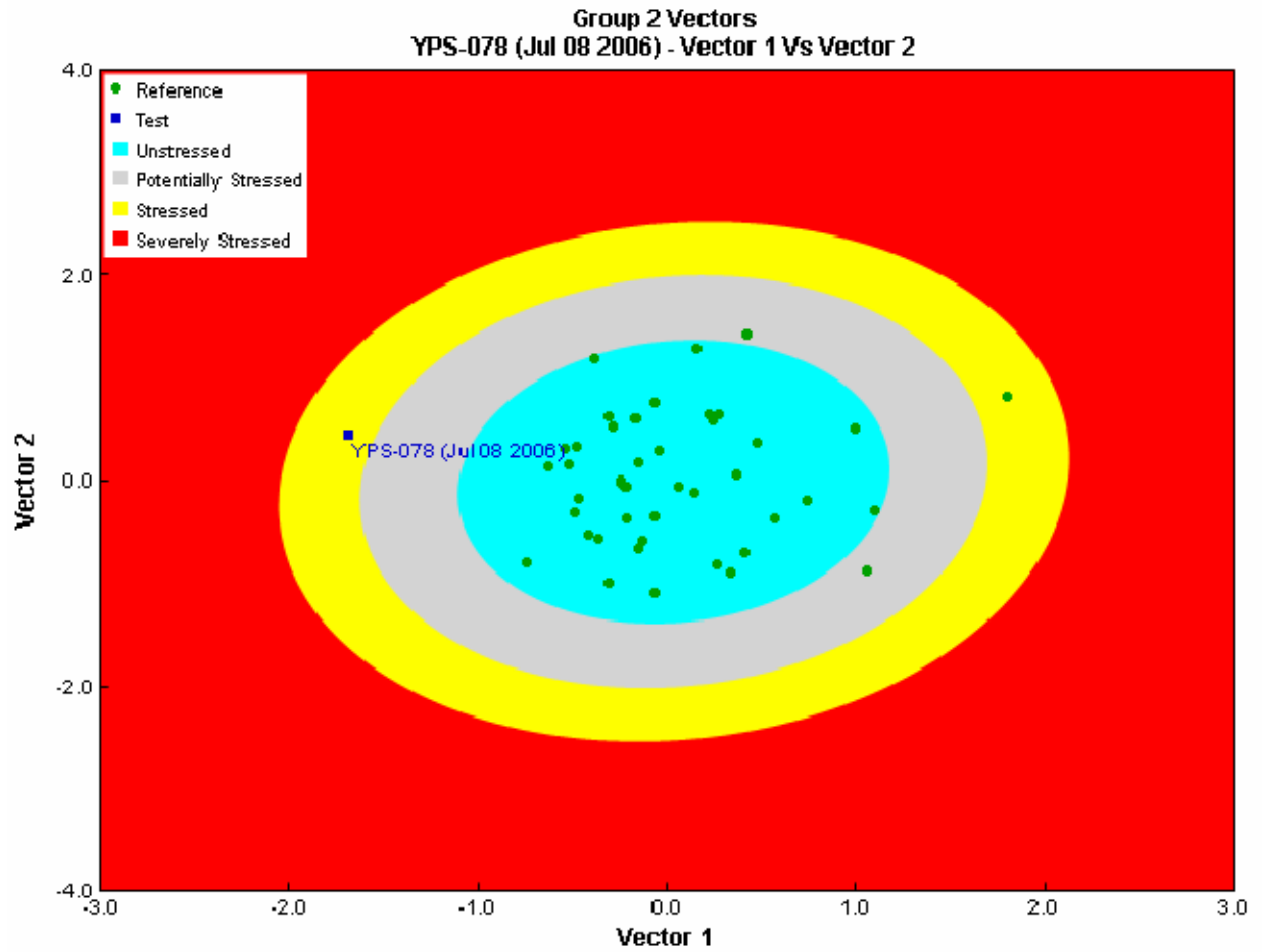
| Description                  | Value  |
|------------------------------|--------|
| Bray-Curtis Distance         | 0.56   |
| Bray Curtis Reference Median | 465.94 |

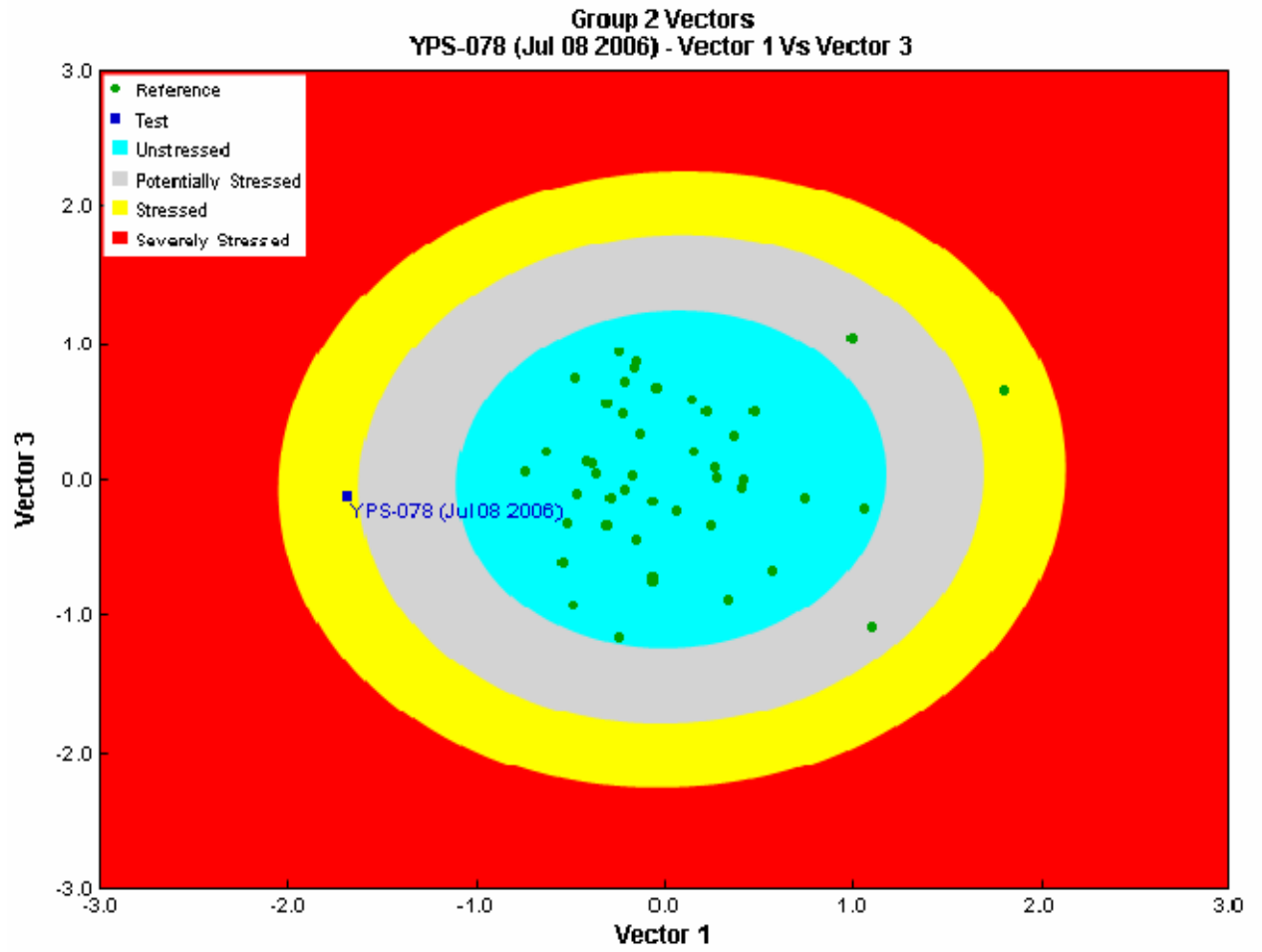
**RIVPACS Analysis**

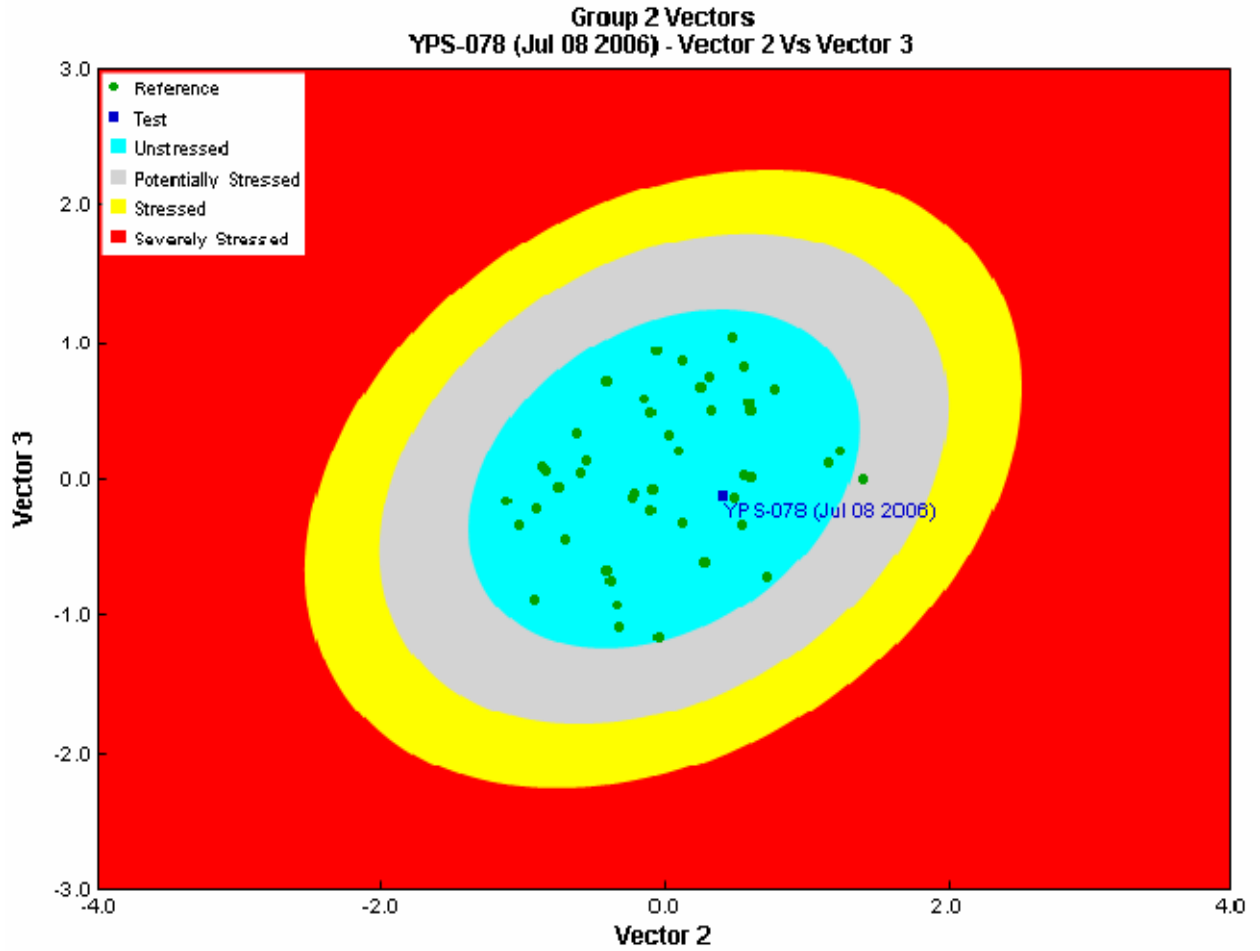
| Taxa             | Probability Of Occurrence | 2006 Total Abundance | Mean of Abundance for Reference site in Group 2 | SD of Abundance for Reference site in Group 2 | Benthic Invertebrate Taxa Tolerance |             |
|------------------|---------------------------|----------------------|---|---|-------------------------------------|-------------|
| Chironomidae     | 0.99                      | 114                  | 153.3   | 61.2  | 6                                   | Insensitive |
| Simuliidae       | 0.66                      | 16                   | 11.1  | 16.4  | 6                                   | Insensitive |
| Baetidae         | 0.64                      | 392                  | 22.2  | 32.7  | 4                                   | Insensitive |
| Nemouridae       | 0.6                       | 18                   | 9.2   | 14.0  | 2                                   | Sensitive   |
| Heptageniidae    | 0.46                      | 6                    | 9.0   | 14.9  | 4                                   | Insensitive |
| Tipulidae        | 0.42                      | 0                    | 2.3   | 3.4   | 3                                   | Insensitive |
| Limnephilidae    | 0.38                      | 0                    | 3.9   | 6.2   | 8                                   | Tolerant    |
| Sperchonidae     | 0.38                      | 0                    | 2.6   | 5.0   | 4                                   | Insensitive |
| Empididae        | 0.34                      | 6                    | 2.3   | 4.5   | 6                                   | Insensitive |
| Chloroperlidae   | 0.31                      | 0                    | 6.0   | 21.9  | 1                                   | Sensitive   |
| Naididae         | 0.31                      | 0                    | 5.2   | 11.0  | 10                                  | Tolerant    |
| Lumbriculidae    | 0.29                      | 18                   | 7.7   | 17.9  | 8                                   | Tolerant    |
| Ephemerelellidae | 0.27                      | 2                    | 3.7   | 12.9  | 1                                   | Sensitive   |
| Ameletidae       | 0.25                      | 12                   | 0.8   | 1.7   | 0                                   | Sensitive   |
| Ceratopogonidae  | 0.23                      | 0                    | 2.0   | 6.4   | 1                                   | Sensitive   |

|                |      |   |     |      |   |             |
|----------------|------|---|-----|------|---|-------------|
| Rhyacophilidae | 0.22 | 6 | 5.1 | 29.8 | 6 | Insensitive |
| Capniidae      | 0.21 | 2 | 0.9 | 2.0  | 2 | Sensitive   |
| Perlodidae     | 0.21 | 4 | 1.6 | 3.6  | 0 | Sensitive   |
| Psychodidae    | 0.2  | 0 | 1.8 | 4.4  | 8 | Tolerant    |

**Site Assessment Graphs**







**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   | 596.0     | 262.0                |                    |             |
| Total No. of Taxa | 12.0      | 10.4                 | 4.1                | 45          |

# Site Assessment Report

## Site Metadata

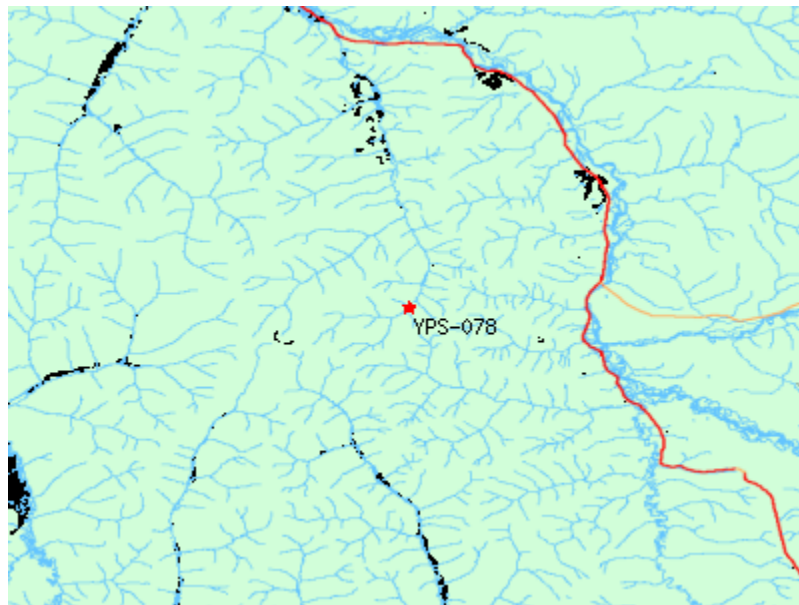
|              |                                      |
|--------------|--------------------------------------|
| Site         | YPS-078.2                            |
| Sample Date  | Aug 06 2008                          |
| Latitude     | N 63° 55' 22"                        |
| Longitude    | W 138° 53' 3"                        |
| Altitude     |                                      |
| Feature Name | Hunker Creek upstream of Ontario Cr. |
| Stream Order | 3                                    |

## Site Photograph

*Up Stream*



## Context Map



**BEAST Prediction Results**

| Predictor Variables    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |       |       |       |
|------------------------|--|-------|-------|-------|
| Predicted Group Number | 2  |       |       |       |
| Group                  | 1  | 2     | 3     | 4     |
| Probability            | 15.0%  | 41.4% | 25.9% | 17.7% |

**Habitat Attributes**

| Variable   | Site  | Reference Group Mean | Standard Deviation | Sample Size |
|--|-------|----------------------|--------------------|-------------|
| Canopy - % coverage (PercentRange)                     | 2     | 1.666667             | 1.073087           | 12          |
| Channel Depth - avg (cm)                               | 8.7   | 31.45833             | 18.58941           | 12          |
| General - pH (pH)                                      | 7     | 7.651333             | 0.808761           | 45          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 382   | 239.05               | 134.161            | 44          |
| General - Turbidity (NTU)                              | 59    | 27.0025              | 44.68459           | 4           |
| Landcover – Alpine (%)                                 | 0     | 0.143083             | 0.219036           | 45          |
| Landcover – Lake (%)                                   | 0     | 0.00565              | 0.014997           | 45          |
| Nitrogen - nitrate + nitrite (mg/L)                    | 0.11  | 0.090714             |                    | 21          |
| Precip Rainfall JUN (mm) (mm)                          | 37    | 36.99778             | 7.555326           | 45          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 114.8 | 129.6067             | 19.21532           | 45          |
| Solids - total suspended (TSS) (mg/L)                  | 143.5 | 11.17838             | 30.64302           | 37          |
| Substrate - embeddedness category (Category(1-5))      | 3     | 3.666667             | 0.778499           | 12          |
| Temperature - lake surface or stream (Degrees Celsius) | 6.13  | 10.41333             | 3.98499            | 45          |
| Velocity (Avg) (m/s)                                   | 0.32  | 0.3616               | 0.227003           | 45          |
| Width - Wetted (m)                                     | 3.8   | 5.386667             | 3.792933           | 45          |

**Bray-Curtis Analysis**

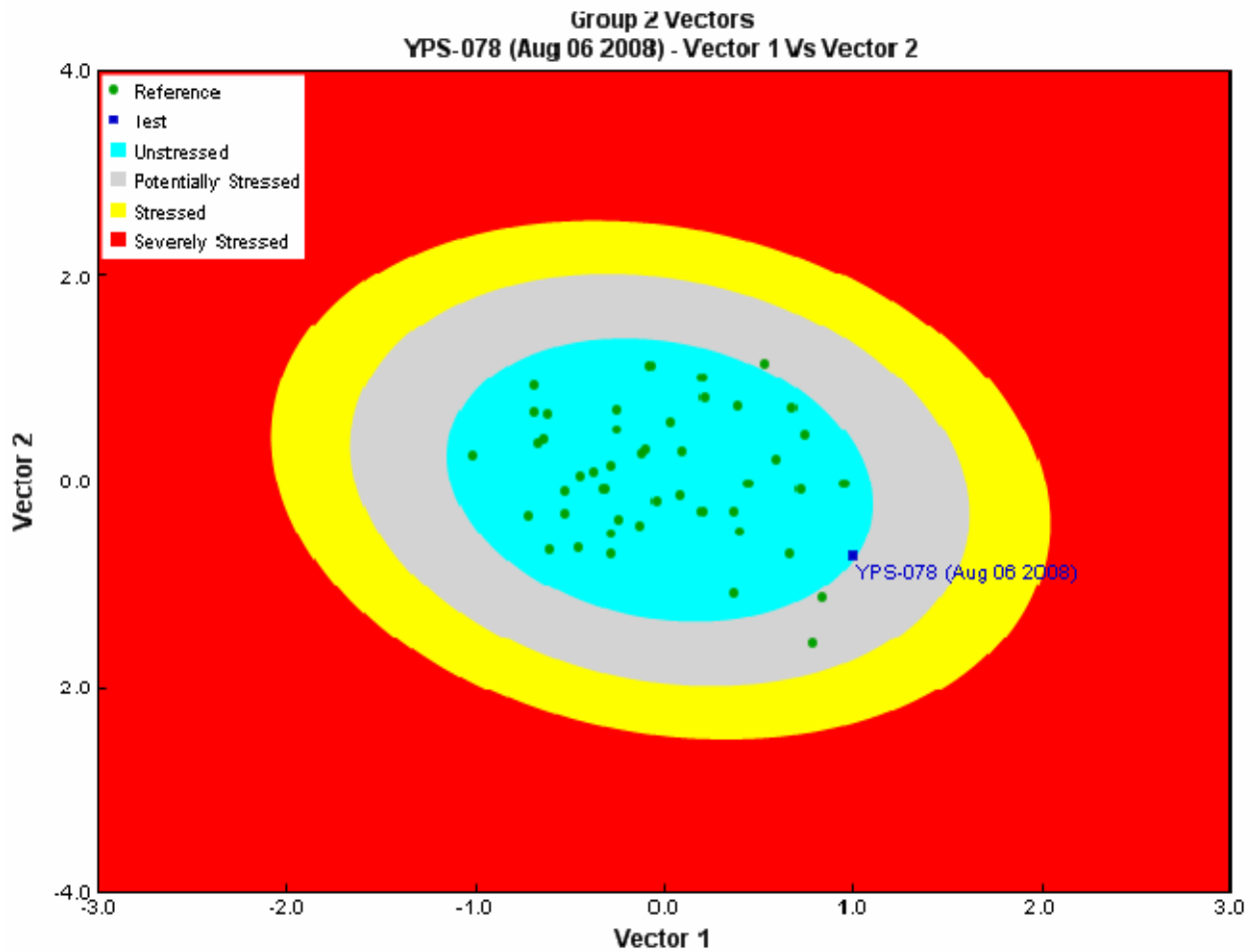
| Description                  | Value  |
|------------------------------|--------|
| Bray-Curtis Distance         | 0.79   |
| Bray Curtis Reference Median | 465.94 |

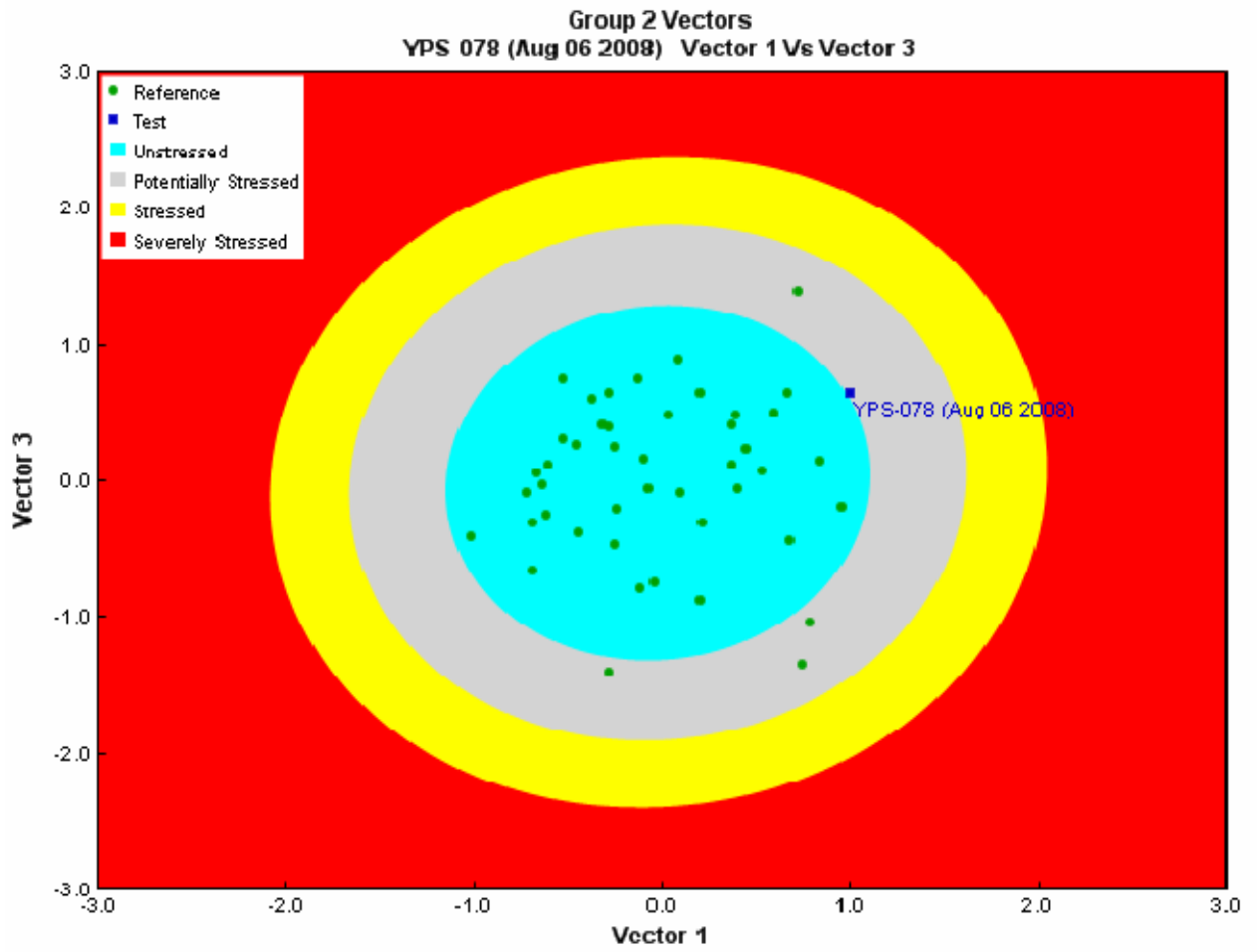
**RIVPACS Analysis**

| Taxa          | Probability Of Occurrence | 2008 Total Abundance | Mean of Abundance for Reference site in Group 2 | SD of Abundance for Reference site in Group 2 | Benthic Invertebrate Taxa Tolerance |             |
|---------------|---------------------------|----------------------|---|---|-------------------------------------|-------------|
| Chironomidae  | 0.99                      | 442                  | 153.3   | 61.2  | 6                                   | Insensitive |
| Simuliidae    | 0.68                      | 3                    | 11.1  | 16.4  | 6                                   | Insensitive |
| Baetidae      | 0.67                      | 38                   | 22.2  | 32.7  | 4                                   | Insensitive |
| Nemouridae    | 0.6                       | 9.2                  | 9.2   | 14.0  | 2                                   | Sensitive   |
| Heptageniidae | 0.49                      | 17                   | 9.0   | 14.9  | 4                                   | Insensitive |
| Tipulidae     | 0.43                      | 1                    | 2.3   | 3.4   | 3                                   | Insensitive |
| Limnephilidae | 0.38                      | 1                    | 3.9   | 6.2   | 8                                   | Tolerant    |

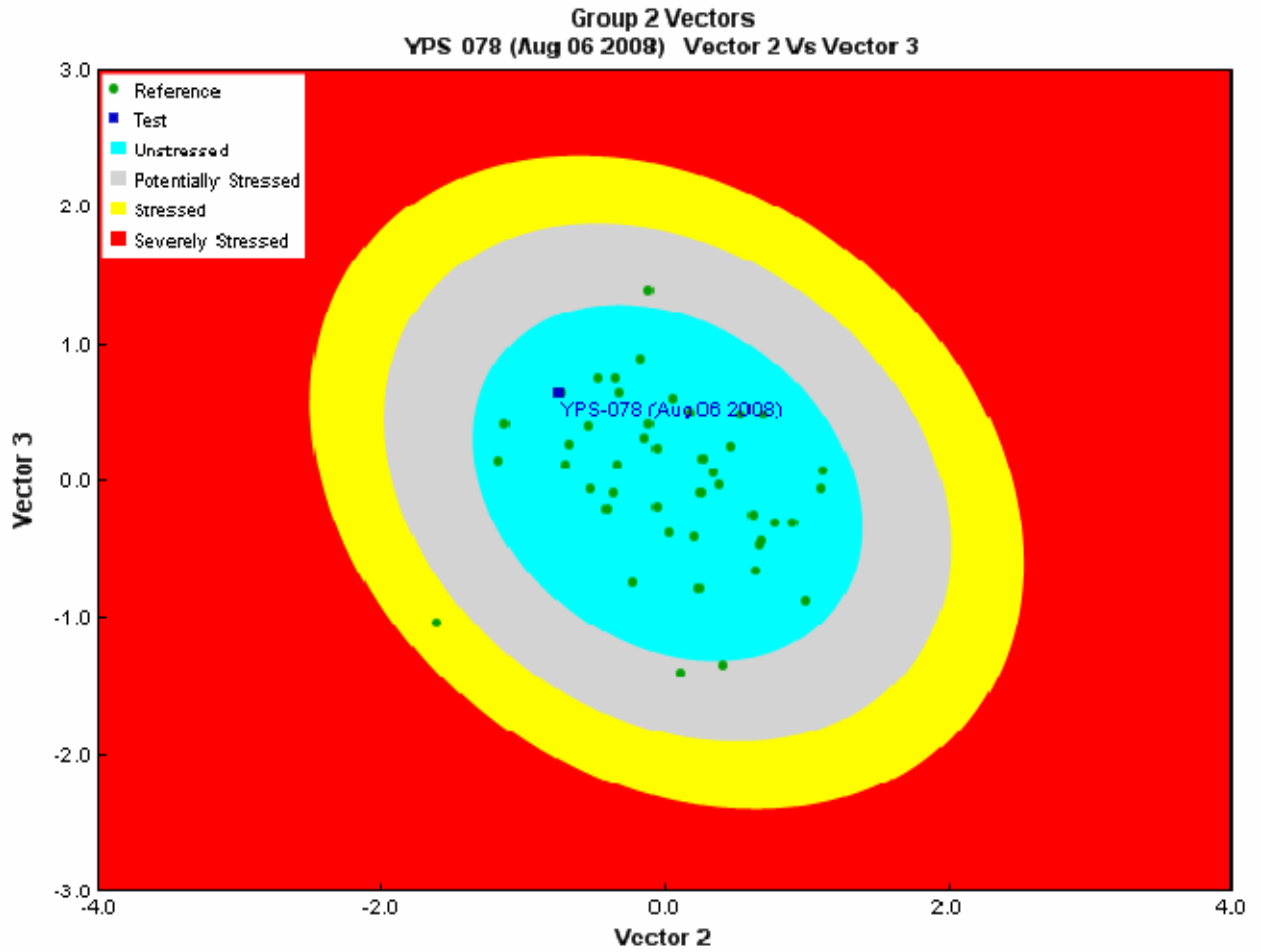
|                 |      |    |     |      |    |             |
|-----------------|------|----|-----|------|----|-------------|
| Sperchonidae    | 0.39 | 0  | 2.6 | 5.0  | 4  | Insensitive |
| Empididae       | 0.36 | 11 | 2.3 | 4.5  | 6  | Insensitive |
| Chloroperlidae  | 0.31 | 1  | 6.0 | 21.9 | 1  | Sensitive   |
| Naididae        | 0.31 | 1  | 5.2 | 11.0 | 10 | Tolerant    |
| Lumbriculidae   | 0.29 | 5  | 7.7 | 17.9 | 8  | Tolerant    |
| Ephemerellidae  | 0.27 | 0  | 3.7 | 12.9 | 1  | Sensitive   |
| Ameletidae      | 0.26 | 2  | 0.8 | 1.7  | 0  | Sensitive   |
| Ceratopogonidae | 0.22 | 0  | 2.0 | 6.4  | 1  | Sensitive   |
| Rhyacophilidae  | 0.22 | 0  | 5.1 | 29.8 | 6  | Insensitive |
| Capniidae       | 0.22 | 19 | 0.9 | 2.0  | 2  | Sensitive   |
| Perlodidae      | 0.22 | 1  | 1.6 | 3.6  | 0  | Sensitive   |
| Psychodidae     | 0.2  | 3  | 1.8 | 4.4  | 8  | Tolerant    |

**Site Assessment Graphs**









**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**

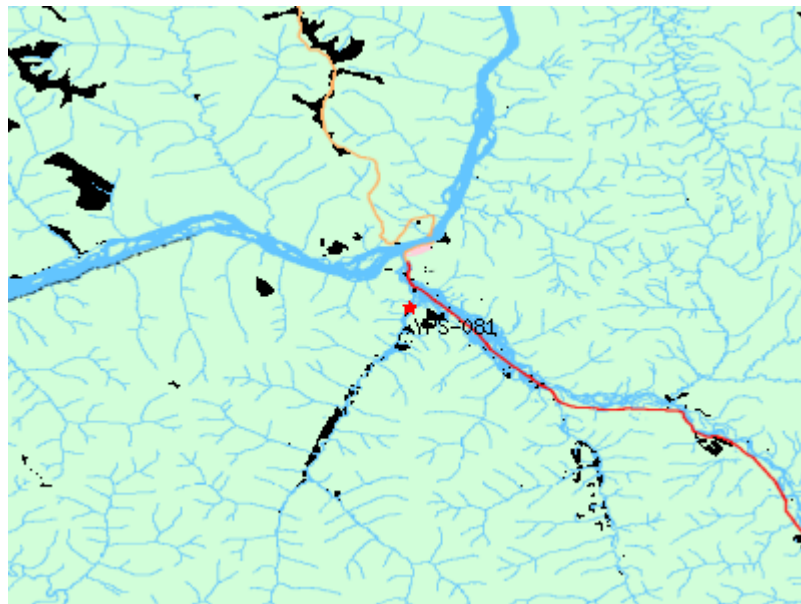
| Metric Name       | Test Site | Reference Group Mean | Standard Deviation | Sample Size |
|-------------------|-----------|----------------------|--------------------|-------------|
| Total Abundance   | 551.0     | 262.0                |                    |             |
| Total No. of Taxa | 15.0      | 10.4                 | 4.1                | 45          |

## Site Assessment Report

### Site Metadata

|              |                          |
|--------------|--------------------------|
| Site         | YPS-081.1                |
| Sample Date  | Jul 08 2006              |
| Latitude     | N 64° 1' 50"             |
| Longitude    | W 139° 23' 19"           |
| Altitude     |                          |
| Feature Name | Bonanza Creek at Highway |
| Stream Order | 3                        |

### Context Map



### BEAST Prediction Results

|                        |  |       |       |      |
|------------------------|--|-------|-------|------|
| Predictor Variables    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |       |       |      |
| Predicted Group Number | 2  |       |       |      |
| Group                  | 1  | 2     | 3     | 4    |
| Probability            | 15.5%  | 42.7% | 34.8% | 6.9% |

**Habitat Attributes**

| Variable   | Site        | Reference Group Mean |
|--|-------------|----------------------|
| Channel Depth - avg (cm)                               | 28.9        | 37.2                 |
| General - pH (pH)                                      | 8.0         | 7.7                  |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 545.0000000 | 228.1978873          |
| Landcover – Alpine (%)                                 | 0.740       | 25.414               |
| Landcover – Lake (%)                                   | 0.000       | 0.727                |
| Precip Rainfall JUN (mm) (mm)                          | 37.000      | 37.441               |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 114.800     | 129.697              |
| Solids - total suspended (TSS) (mg/L)                  | 5.0000000   | 100.1723077          |
| Substrate - embeddedness category (Category(1-5))      | 4           | 4                    |
| Temperature - lake surface or stream (Degrees Celsius) | 13.9000000  | 9.4281646            |
| Velocity (Avg) (m/s)                                   | 0.55        | 0.45                 |
| Width - Wetted (m)                                     | 8.6         | 5.6                  |

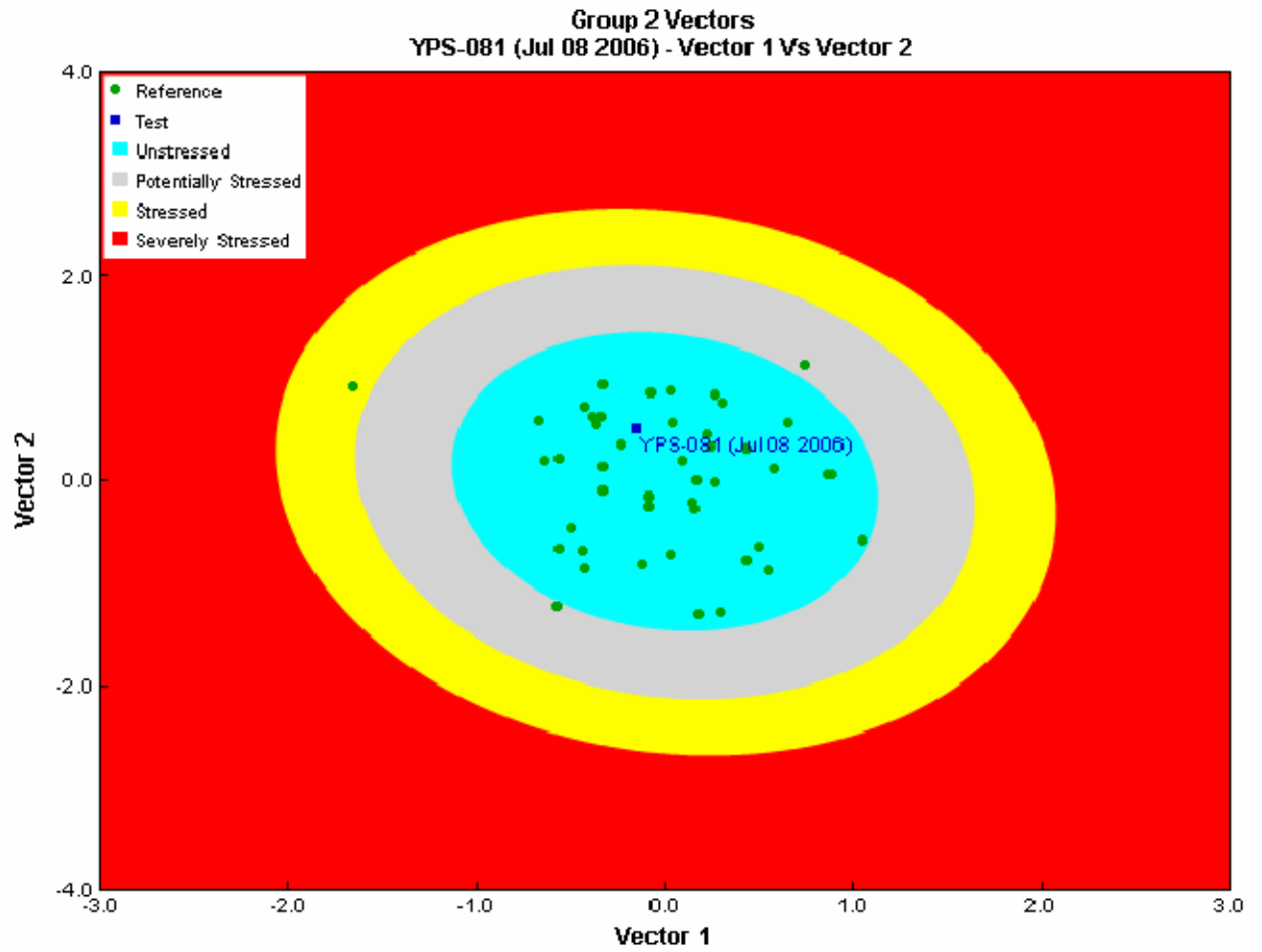
**Bray-Curtis Analysis**

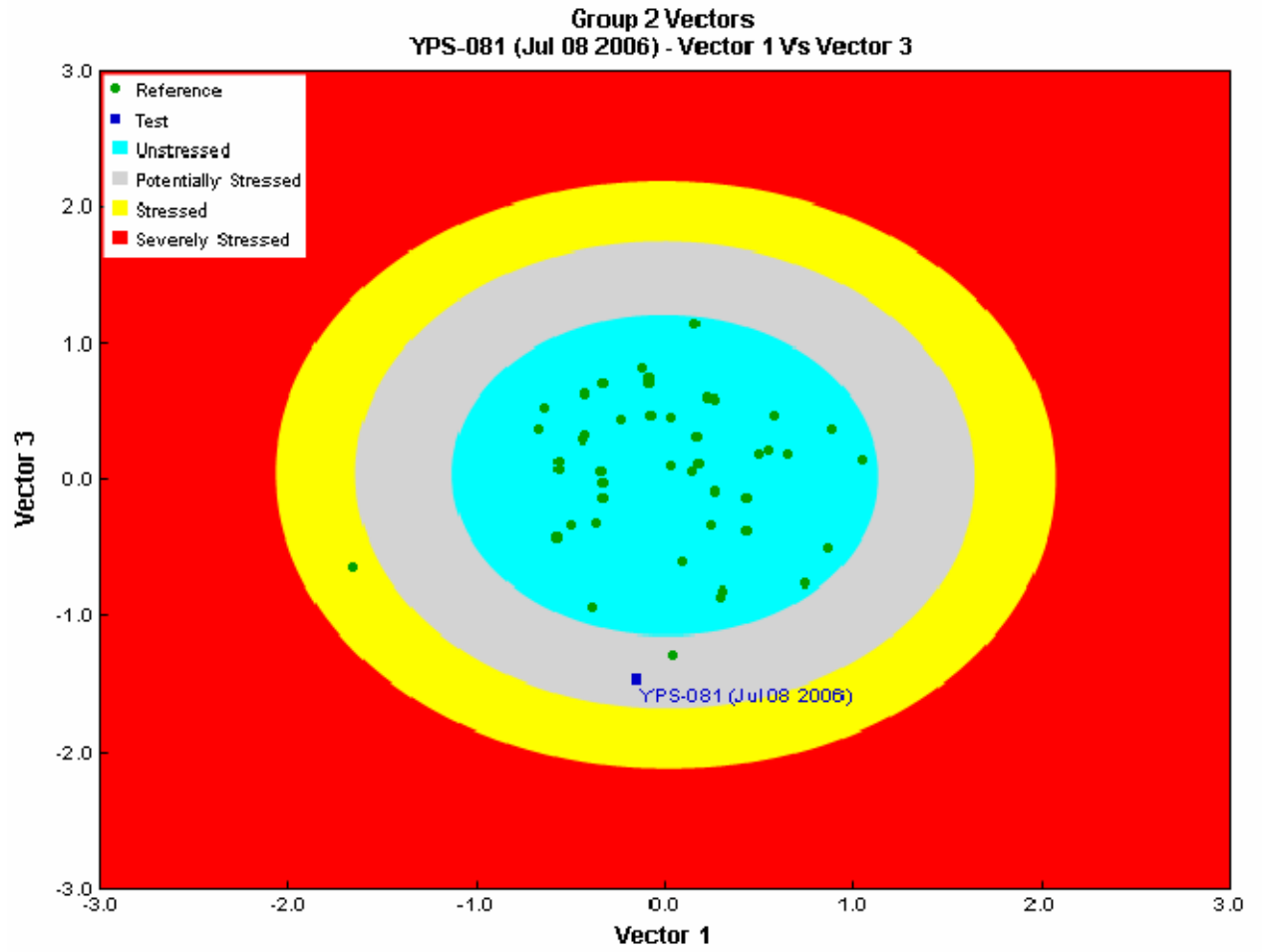
| Description                  | Value  |
|------------------------------|--------|
| Bray-Curtis Distance         | 0.8    |
| Bray Curtis Reference Median | 465.94 |

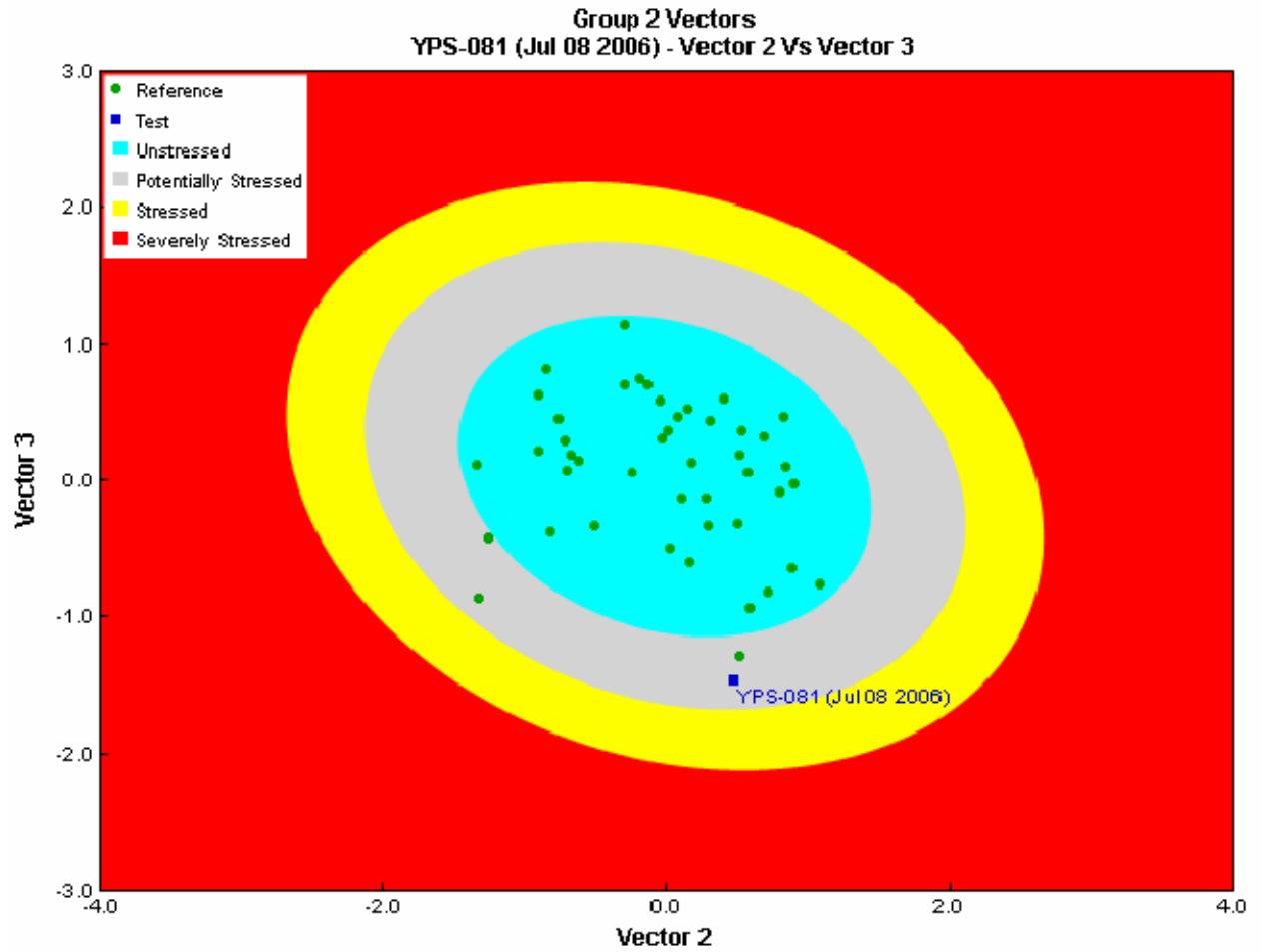
**RIVPACS Analysis**

| Taxa            | Probability Of Occurrence | Abundance | Mean of Abundance for Reference Sites in Group 2 | SD of Abundance for Reference sites in Group 2 | Benthic Invertebrate Taxa Tolerance |             |
|-----------------|---------------------------|-----------|--|--|-------------------------------------|-------------|
| Chironomidae    | 0.99                      | 408       | 153.3  | 61.2   | 6                                   | Insensitive |
| Simuliidae      | 0.63                      | 10        | 11.1   | 16.4   | 6                                   | Insensitive |
| Baetidae        | 0.61                      | 190       | 22.2   | 32.7   | 4                                   | Insensitive |
| Nemouridae      | 0.58                      | 0         | 9.2  | 14.0   | 2                                   | Sensitive   |
| Heptageniidae   | 0.44                      | 8         | 9.0  | 14.9   | 4                                   | Insensitive |
| Tipulidae       | 0.41                      | 12        | 2.3  | 3.4  | 3                                   | Insensitive |
| Sperchonidae    | 0.37                      | 0         | 3.9  | 6.2  | 8                                   | Tolerant    |
| Limnephilidae   | 0.36                      | 4         | 2.6  | 5.0  | 4                                   | Insensitive |
| Naididae        | 0.32                      | 0         | 5.2  | 11.0   | 10                                  | Tolerant    |
| Chloroperlidae  | 0.31                      | 0         | 6.0  | 21.9   | 1                                   | Sensitive   |
| Empididae       | 0.3                       | 24        | 2.3  | 4.5  | 6                                   | Insensitive |
| Lumbriculidae   | 0.29                      | 0         | 7.7  | 17.9   | 8                                   | Tolerant    |
| Ephemerellidae  | 0.27                      | 0         | 3.7  | 12.9   | 1                                   | Sensitive   |
| Ceratopogonidae | 0.24                      | 8         | 5.1  | 29.8   | 6                                   | Insensitive |
| Ameletidae      | 0.23                      | 0         | 0.8  | 1.7  | 0                                   | Sensitive   |
| Rhyacophilidae  | 0.22                      | 0         | 1.6  | 3.6  | 0                                   | Sensitive   |
| Capniidae       | 0.19                      | 0         | 2.0  | 6.4  | 1                                   | Sensitive   |
| Perlodidae      | 0.19                      | 2         | 0.9  | 2.0  | 2                                   | Sensitive   |
| Psychodidae     | 0.19                      | 6         | 0.5  | 1.4  | 10                                  | Tolerant    |
| Lebertiidae     | 0.17                      | 0         | 1.8  | 4.4  | 8                                   | Tolerant    |

Site Assessment Graphs







**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         | Potentially Stressed |
| Overall                      | Potentially Stressed |

**Site Metrics**

| Metric Name       | Test Site | Reference Group Mean | Standard Deviation | Sample Size |
|-------------------|-----------|----------------------|--------------------|-------------|
| Total Abundance   | 696.0     | 262.0                |                    |             |
| Total No. of Taxa | 13.0      | 10.4                 | 4.1                | 45          |

# Site Assessment Report

## Site Metadata

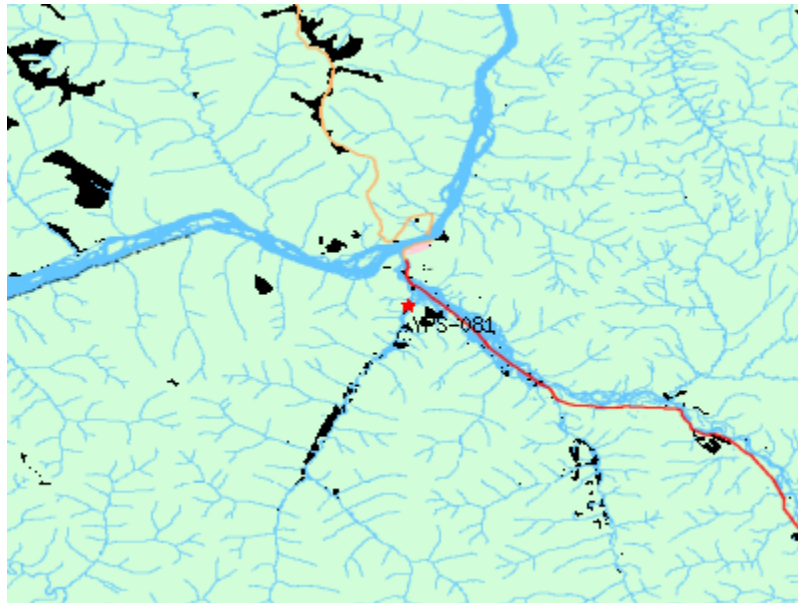
|              |                          |
|--------------|--------------------------|
| Site         | YPS-081.2                |
| Sample Date  | Aug 06 2008              |
| Latitude     | N 64° 1' 50"             |
| Longitude    | W 139° 23' 19"           |
| Altitude     | 1131                     |
| Feature Name | Bonanza Creek at Highway |
| Stream Order | 3                        |

## Site Photograph

*Up Stream*



## Context Map



**BEAST Prediction Results**

|                               |  |          |          |          |
|-------------------------------|--|----------|----------|----------|
| <b>Predictor Variables</b>    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |          |          |          |
| <b>Predicted Group Number</b> | 2  |          |          |          |
| <b>Group</b>                  | <b>1</b>   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>Probability</b>            | 16.6%  | 41.2%    | 31.7%    | 10.5%    |

**Habitat Attributes**

| Variable   | Site  | Reference Group Mean | Standard Deviation | Sample Size |
|--|-------|----------------------|--------------------|-------------|
| Canopy - % coverage (PercentRange)                     | 1     | 1.666667             | 1.073087           | 12          |
| Channel Depth - avg (cm)                               | 16.6  | 31.45833             | 18.58941           | 12          |
| General - pH (pH)                                      | 6.9   | 7.651333             | 0.808761           | 45          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 498   | 239.05               | 134.161            | 44          |
| General - Turbidity (NTU)                              | 11    | 27.0025              | 44.68459           | 4           |
| Landcover – Alpine (%)                                 | 0.74  | 0.143083             | 0.219036           | 45          |
| Landcover – Lake (%)                                   | 0     | 0.00565              | 0.014997           | 45          |
| Nitrogen - nitrate + nitrite (mg/L)                    | 0.01  | 0.090714             |                    | 21          |
| Precip Rainfall JUN (mm) (mm)                          | 37    | 36.99778             | 7.555326           | 45          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 114.8 | 129.6067             | 19.21532           | 45          |
| Solids - total suspended (TSS) (mg/L)                  | 12.25 | 11.17838             | 30.64302           | 37          |
| Substrate - embeddedness category (Category(1-5))      | 3     | 3.666667             | 0.778499           | 12          |
| Temperature - lake surface or stream (Degrees Celsius) | 9.51  | 10.41333             | 3.98499            | 45          |
| Velocity (Avg) (m/s)                                   | 0.45  | 0.3616               | 0.227003           | 45          |
| Width - Wetted (m)                                     | 13.4  | 5.386667             | 3.792933           | 45          |

**Bray-Curtis Analysis**

| Description                  | Value  |
|------------------------------|--------|
| Bray-Curtis Distance         | 0.63   |
| Bray Curtis Reference Median | 465.94 |

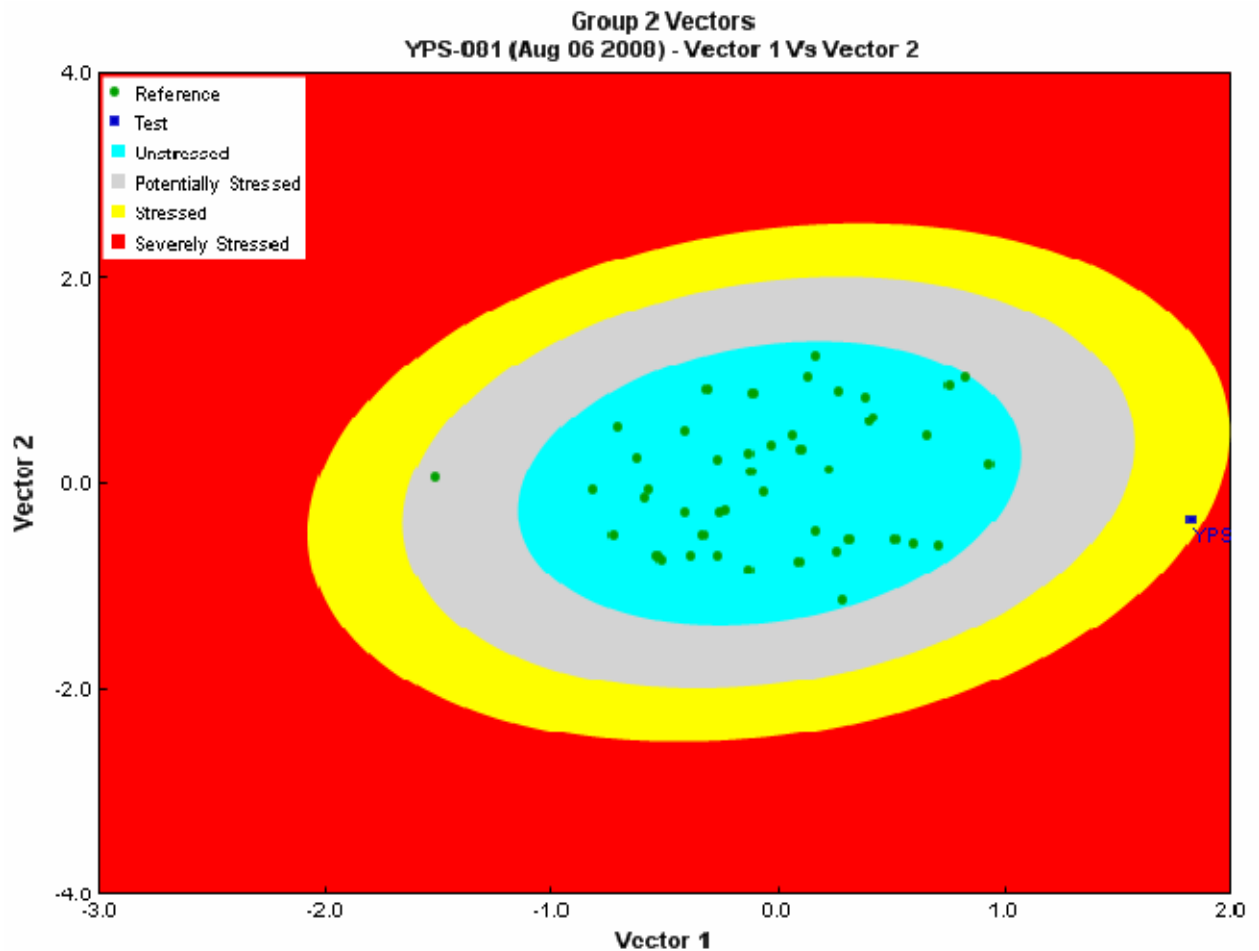
**RIVPACS Analysis**

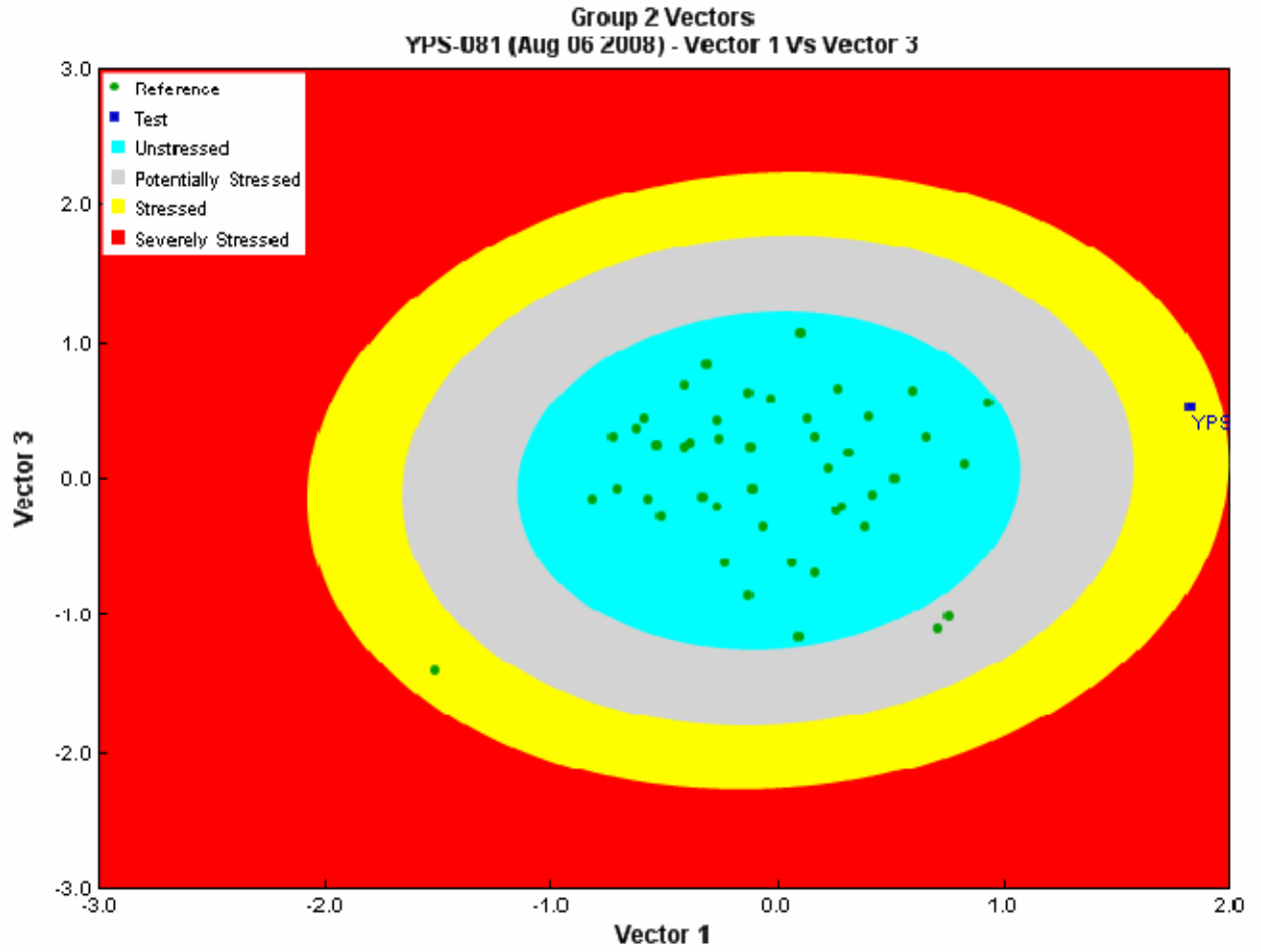
| Taxa          | Probability Of Occurrence | Abundance | Mean of Abundance for Reference site in Group 2 | SD of Abundance for Reference Site in Group 2 | Benthic Invertebrate Taxa Tolerance |             |
|---------------|---------------------------|-----------|---|---|-------------------------------------|-------------|
| Chironomidae  | 0.99                      | 41        | 153.3   | 61.2  | 6                                   | Insensitive |
| Simuliidae    | 0.65                      | -         | 11.1  | 16.4  | 6                                   | Insensitive |
| Baetidae      | 0.63                      | 91        | 22.2  | 32.7  | 4                                   | Insensitive |
| Nemouridae    | 0.59                      | -         | 9.2   | 14.0  | 2                                   | Sensitive   |
| Heptageniidae | 0.46                      | -         | 9.0   | 14.9  | 4                                   | Insensitive |
| Tipulidae     | 0.42                      | 2         | 2.3   | 3.4   | 3                                   | Insensitive |

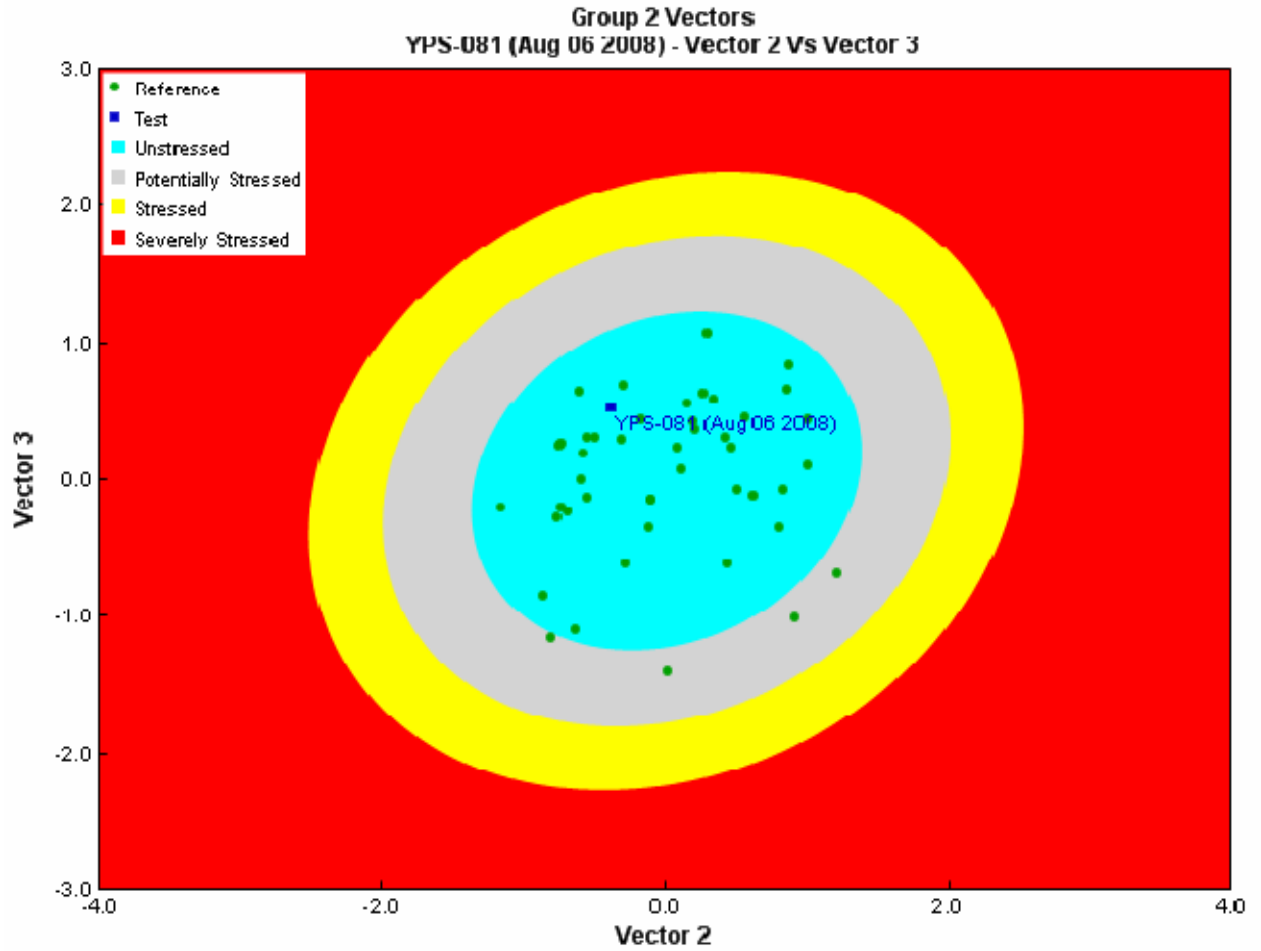


|                 |      |   |     |      |    |             |
|-----------------|------|---|-----|------|----|-------------|
| Limnephilidae   | 0.37 | - | 2.6 | 5.0  | 4  | Insensitive |
| Sperchonidae    | 0.37 | - | 3.9 | 6.2  | 8  | Tolerant    |
| Empididae       | 0.32 | - | 2.3 | 4.5  | 6  | Insensitive |
| Naididae        | 0.32 | 1 | 5.2 | 11.0 | 10 | Tolerant    |
| Chloroperlidae  | 0.31 | - | 6.0 | 21.9 | 1  | Sensitive   |
| Lumbriculidae   | 0.29 | - | 7.7 | 17.9 | 8  | Tolerant    |
| Ephemerellidae  | 0.28 | 1 | 3.7 | 12.9 | 1  | Sensitive   |
| Ameletidae      | 0.24 | - | 0.8 | 1.7  | 0  | Sensitive   |
| Ceratopogonidae | 0.23 | - | 5.1 | 29.8 | 6  | Insensitive |
| Rhyacophilidae  | 0.22 | - | 1.6 | 3.6  | 0  | Sensitive   |
| Capniidae       | 0.2  | - | 2.0 | 6.4  | 1  | Sensitive   |
| Perlodidae      | 0.2  | 1 | 0.9 | 2.0  | 2  | Sensitive   |
| Psychodidae     | 0.19 | - | 0.5 | 1.4  | 10 | Tolerant    |
| Lebertiidae     | 0.18 | 3 | 1.8 | 4.4  | 8  | Tolerant    |

Site Assessment Graphs







**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**

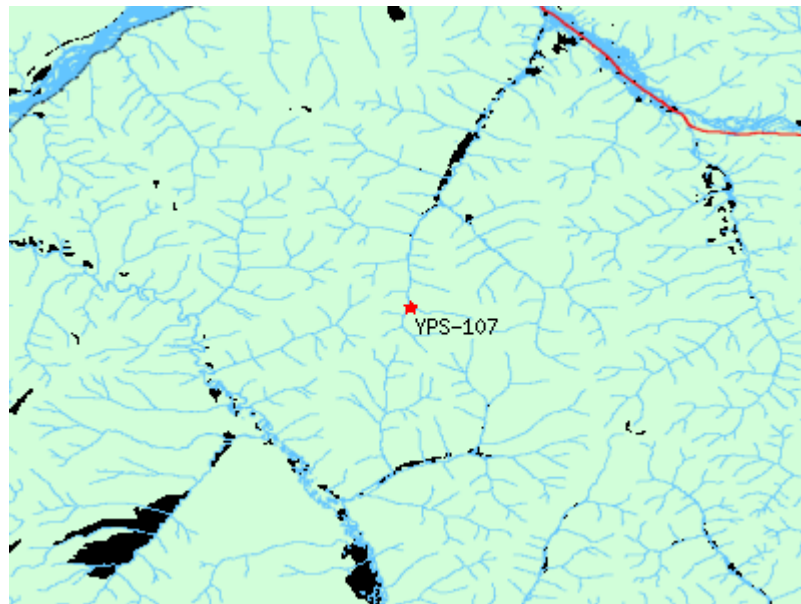
| Metric Name       | Test Site | Reference Group Mean | Standard Deviation | Sample Size |
|-------------------|-----------|----------------------|--------------------|-------------|
| Total Abundance   | 144.0     | 262.0                |                    |             |
| Total No. of Taxa | 9.0       | 10.4                 | 4.1                | 45          |

## Site Assessment Report

### Site Metadata

|              |                    |
|--------------|--------------------|
| Site         | YPS-107.1          |
| Sample Date  | Jul 15 2006        |
| Latitude     | N 63° 51' 44"      |
| Longitude    | W 139° 14' 48"     |
| Altitude     |                    |
| Feature Name | Eldorado Creek top |
| Stream Order | 2                  |

### Context Map



### BEAST Prediction Results

|                        |  |       |       |       |
|------------------------|--|-------|-------|-------|
| Predictor Variables    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |       |       |       |
| Predicted Group Number | 2  |       |       |       |
| Group                  | 1  | 2     | 3     | 4     |
| Probability            | 16.2%  | 41.5% | 29.7% | 12.6% |

### Habitat Attributes

| Variable                                       | Site        | Reference Group Mean | Standard Deviation | Sample Size |
|--|-------------|----------------------|--------------------|-------------|
| Channel Depth - avg (cm)                       | 13.4        | 37.2                 | 18.58941           | 12          |
| General - pH (pH)                              | 7.8         | 7.7                  | 0.808761           | 45          |
| General – Specific Conductance (@ 25 C)(uS/cm) | 334.0000000 | 228.1978893          | 44.68459           | 4           |
| Landcover – Alpine (%)                         | 0.000       | 25.414               | 0.219036           | 45          |
| Landcover – Lake (%)                           | 0.000       | 0.727                | 0.014997           | 45          |
| Precip Rainfall JUN (mm) (mm)                  | 37.000      | 37.441               | 7.555326           | 45          |
| Precip Snowfall Total ANNUAL (mm) (mm)         | 114.8       | 129.697              | 19.21532           | 45          |
| Solids - total suspended (TSS) (mg/L)          | 5.0000000   | 100.1723077          | 30.64302           | 37          |

|  |           |           |          |    |
|--|-----------|-----------|----------|----|
| Substrate - embeddedness category (Category(1-5))      | 5         | 4         | 0.778499 | 12 |
| Temperature - lake surface or stream (Degrees Celsius) | 8.4000000 | 9.4281646 | 3.98499  | 45 |
| Velocity (Avg) (m/s)                                   | 0.42      | 0.45      | 0.227003 | 45 |
| Width - Wetted (m)                                     | 3.4       | 5.6       | 3.792933 | 45 |

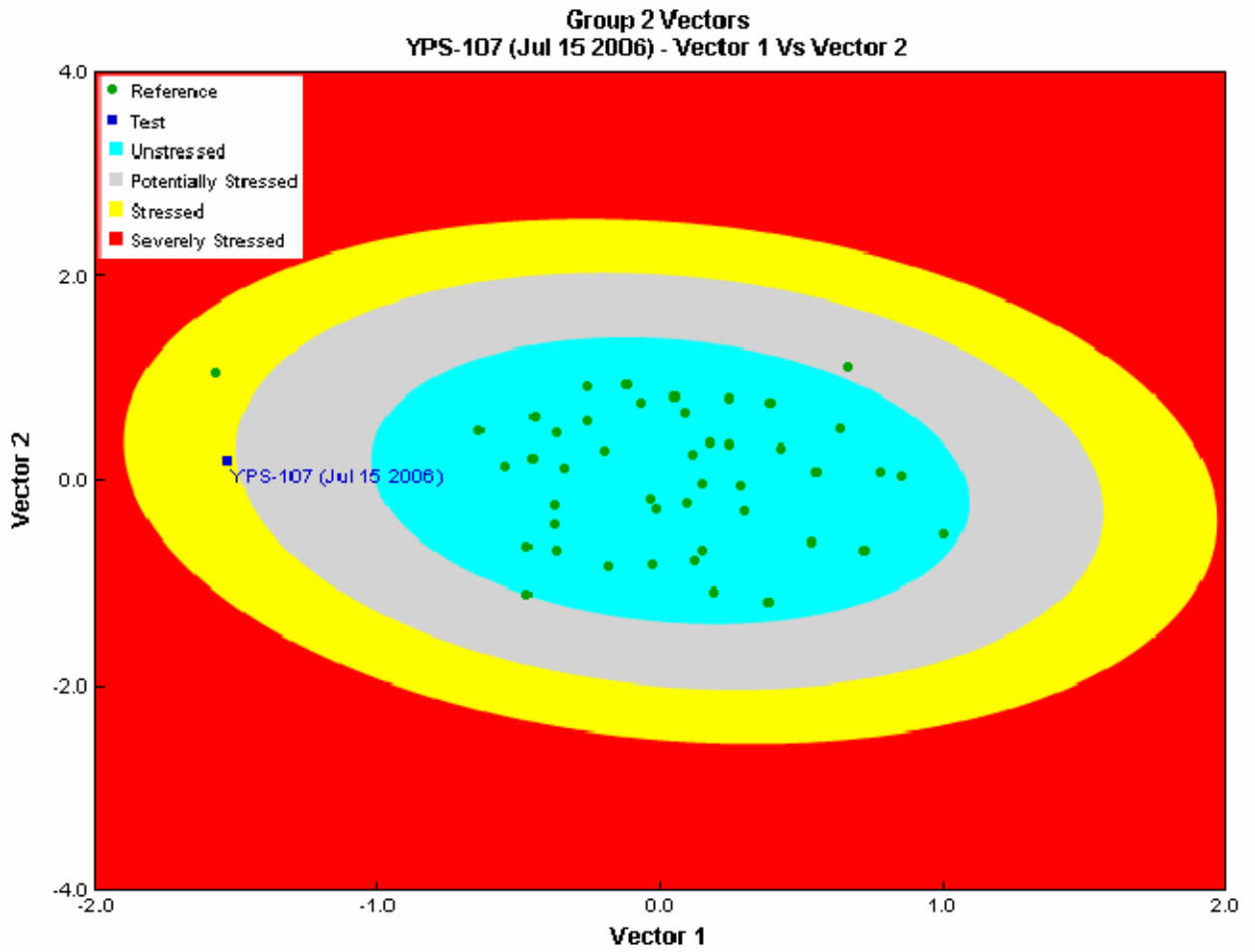
**Bray-Curtis Analysis**

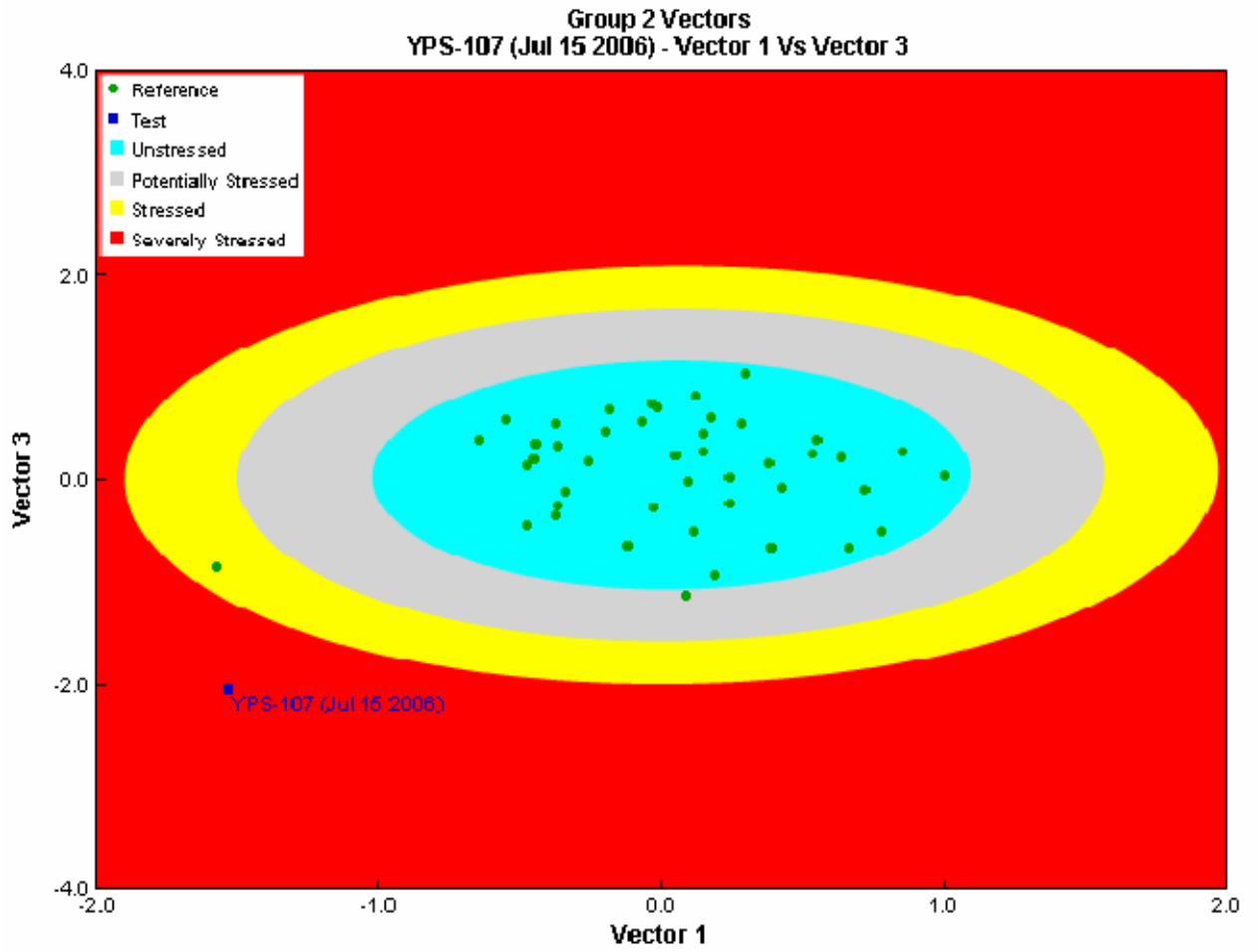
| Description                  | Value  |
|------------------------------|--------|
| Bray-Curtis Distance         | 0.93   |
| Bray Curtis Reference Median | 465.94 |

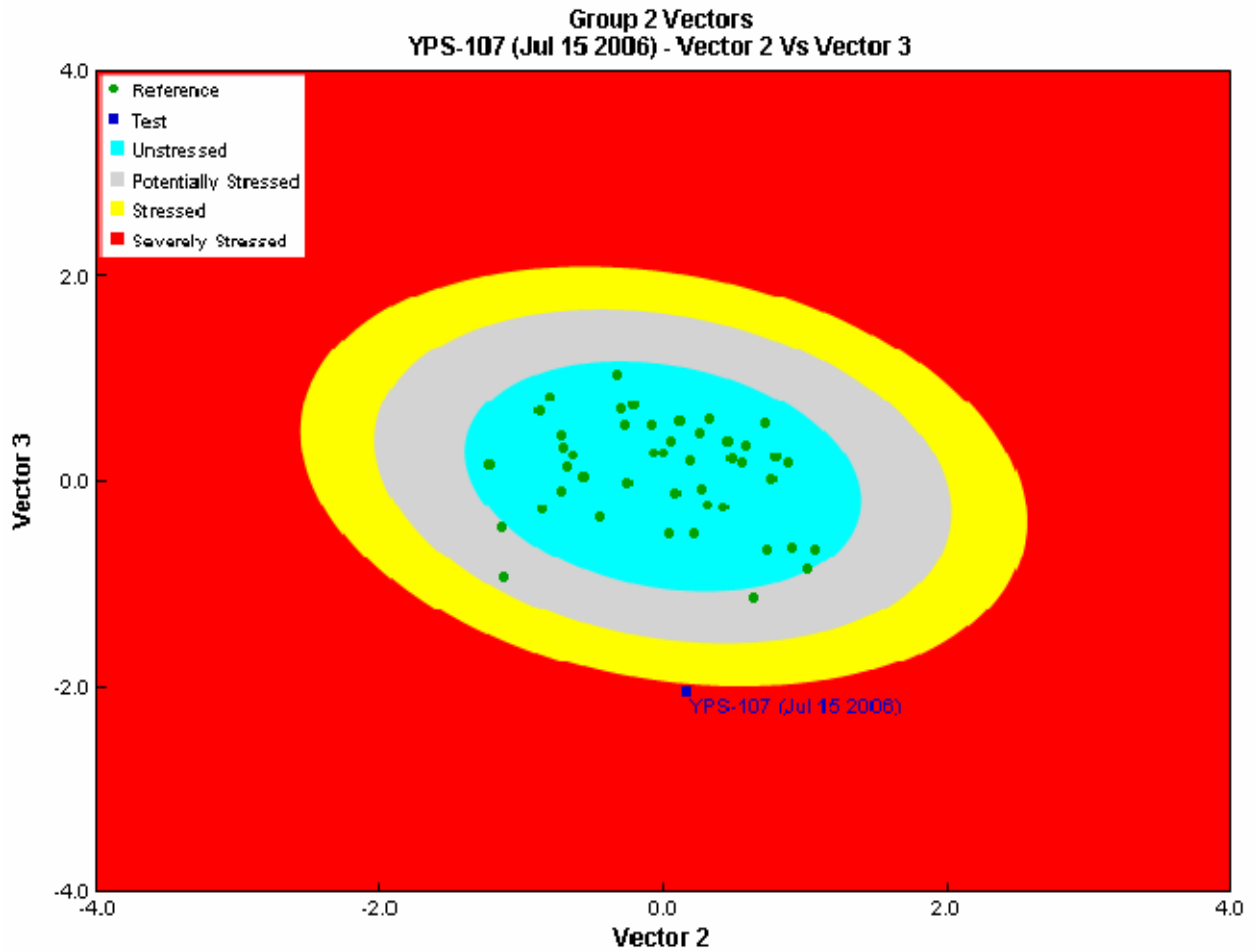
**RIVPACS Analysis**

| Taxa             | Probability Of Occurrence | Abundance | Mean of Abundance for Reference site in Group 2 | SD of Abundance for Reference Site in Group 2 | Benthic Invertebrate Taxa Tolerance |             |
|------------------|---------------------------|-----------|---|---|-------------------------------------|-------------|
| Chironomidae     | 0.99                      | 204       | 153.3   | 61.2  | 6                                   | Insensitive |
| Simuliidae       | 0.66                      | 336       | 11.1  | 16.4  | 6                                   | Insensitive |
| Baetidae         | 0.64                      | 456       | 22.2  | 32.7  | 4                                   | Insensitive |
| Nemouridae       | 0.6                       | 132       | 9.2   | 14.0  | 2                                   | Sensitive   |
| Heptageniidae    | 0.47                      | 2064      | 9.0   | 14.9  | 4                                   | Insensitive |
| Tipulidae        | 0.42                      | 0         | 2.3   | 3.4   | 3                                   | Insensitive |
| Sperchonidae     | 0.38                      | 0         | 3.9   | 6.2   | 8                                   | Tolerant    |
| Limnephilidae    | 0.37                      | 0         | 2.6   | 5.0   | 4                                   | Insensitive |
| Empididae        | 0.34                      | 324       | 2.3   | 4.5   | 6                                   | Insensitive |
| Chloroperlidae   | 0.31                      | 0         | 6.0   | 21.9  | 1                                   | Sensitive   |
| Naididae         | 0.31                      | 0         | 5.2   | 11.0  | 10                                  | Tolerant    |
| Lumbriculidae    | 0.29                      | 240       | 7.7   | 17.9  | 8                                   | Tolerant    |
| Ephemerelellidae | 0.27                      | 0         | 3.7   | 12.9  | 1                                   | Sensitive   |
| Ameletidae       | 0.25                      | 48        | 0.8   | 1.7   | 0                                   | Sensitive   |
| Ceratopogonidae  | 0.23                      | 0         | 5.1   | 29.8  | 6                                   | Insensitive |
| Rhyacophilidae   | 0.22                      | 0         | 1.6   | 3.6   | 0                                   | Sensitive   |
| Capniidae        | 0.21                      | 0         | 2.0   | 6.4   | 1                                   | Sensitive   |
| Perlodidae       | 0.21                      | 0         | 0.9   | 2.0   | 2                                   | Sensitive   |
| Psychodidae      | 0.2                       | 0         | 0.5   | 1.4   | 10                                  | Tolerant    |

Site Assessment Graphs







**Site Assessment Vector Data**

| Assessment For The Test Site |                   |
|------------------------------|-------------------|
| Vector 1 Vs Vector 2         | 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   | 3804.0    | 262.0                |                    |             |
| Total No. of Taxa | 8.0       | 10.4                 | 4.1                | 45          |



# Site Assessment Report

## Site Metadata

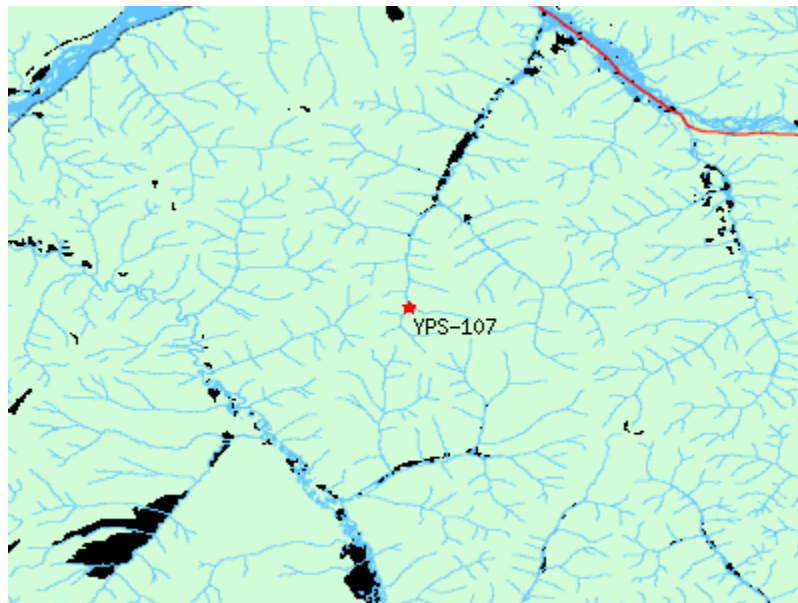
|              |                    |
|--------------|--------------------|
| Site         | YPS-107.2          |
| Sample Date  | Aug 06 2008        |
| Latitude     | N 63° 51' 44"      |
| Longitude    | W 139° 14' 48"     |
| Altitude     | 2034               |
| Feature Name | Eldorado Creek top |
| Stream Order | 2                  |

## Site Photograph

*Up Stream*



## Context Map



**BEAST Prediction Results**

|                               |  |          |          |          |
|-------------------------------|--|----------|----------|----------|
| <b>Predictor Variables</b>    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |          |          |          |
| <b>Predicted Group Number</b> | 2  |          |          |          |
| <b>Group</b>                  | <b>1</b>   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>Probability</b>            | 16.5%  | 40.0%    | 27.7%    | 15.7%    |

**Habitat Attributes**

| Variable   | Site       | Reference Group Mean | Standard Deviation | Sample Size |
|--|------------|----------------------|--------------------|-------------|
| Canopy - % coverage (PercentRange)                     | 1.00       | 1.666667             | 1.073087           | 12          |
| Channel Depth - avg (cm)                               | 6.3        | 31.45833             | 18.58941           | 12          |
| General - pH (pH)                                      | 6.9        | 7.651333             | 0.808761           | 45          |
| General - Turbidity (NTU)                              | 7.0000000  | 27.0025              | 44.68459           | 4           |
| Landcover – Alpine (%)                                 | 0.000      | 0.143083             | 0.219036           | 45          |
| Landcover – Lake (%)                                   | 0.000      | 0.00565              | 0.014997           | 45          |
| Nitrogen - nitrate + nitrite (mg/L)                    | 0.0200000  | 0.090714             |                    | 21          |
| Precip Rainfall JUN (mm) (mm)                          | 37.000     | 36.99778             | 7.555326           | 45          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 114.8      | 129.6067             | 19.21532           | 45          |
| Solids - total suspended (TSS) (mg/L)                  | 15.1700000 | 11.17838             | 30.64302           | 37          |
| Substrate - embeddedness category (Category(1-5))      | 3          | 3.666667             | 0.778499           | 12          |
| Temperature - lake surface or stream (Degrees Celsius) | 5.9900000  | 10.41333             | 3.98499            | 45          |
| Velocity (Avg) (m/s)                                   | 0.51       | 0.3616               | 0.227003           | 45          |
| Width - Wetted (m)                                     | 2.6        | 5.386667             | 3.792933           | 45          |

**Bray-Curtis Analysis**

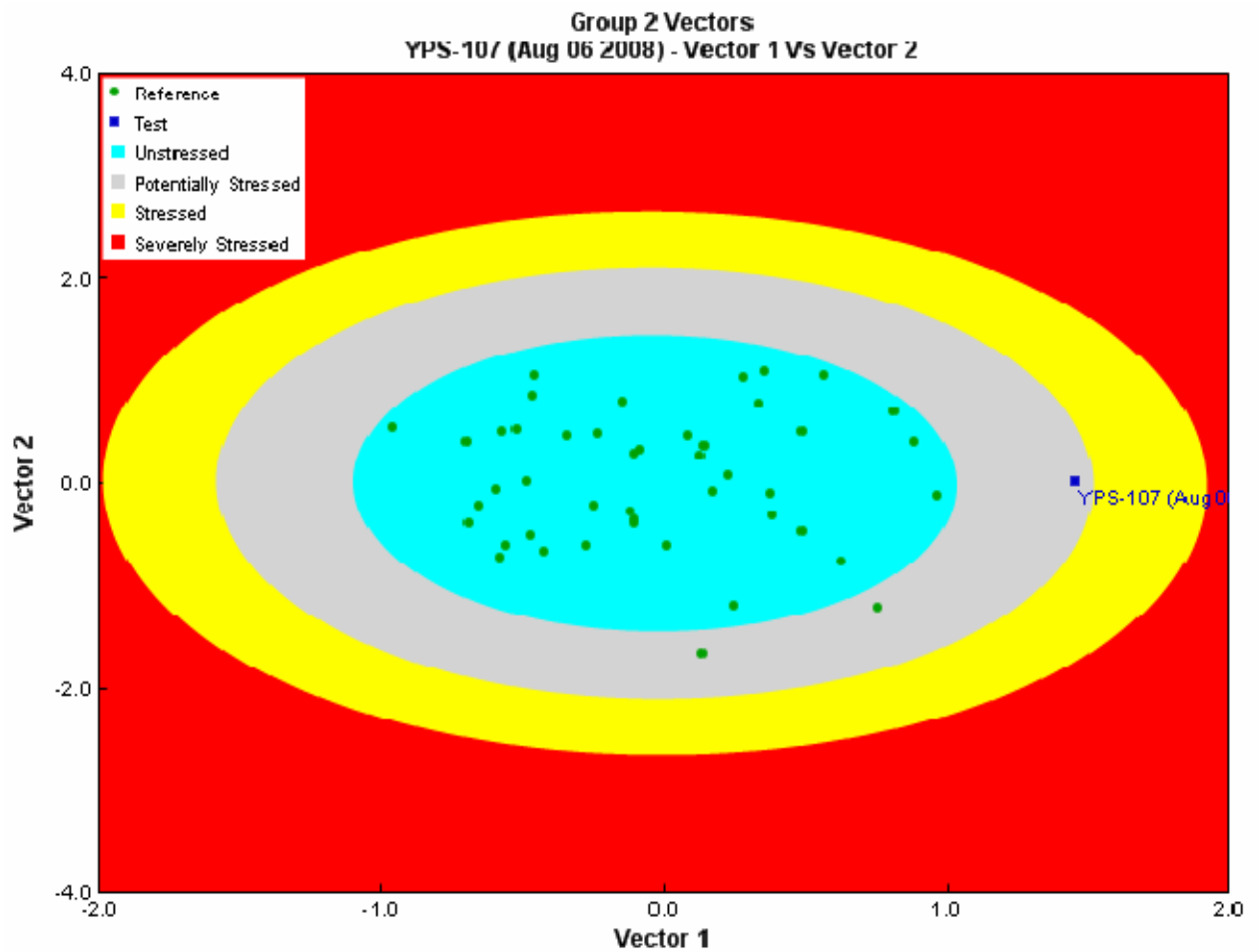
| Description                  | Value  |
|------------------------------|--------|
| Bray-Curtis Distance         | 0.41   |
| Bray Curtis Reference Median | 465.94 |

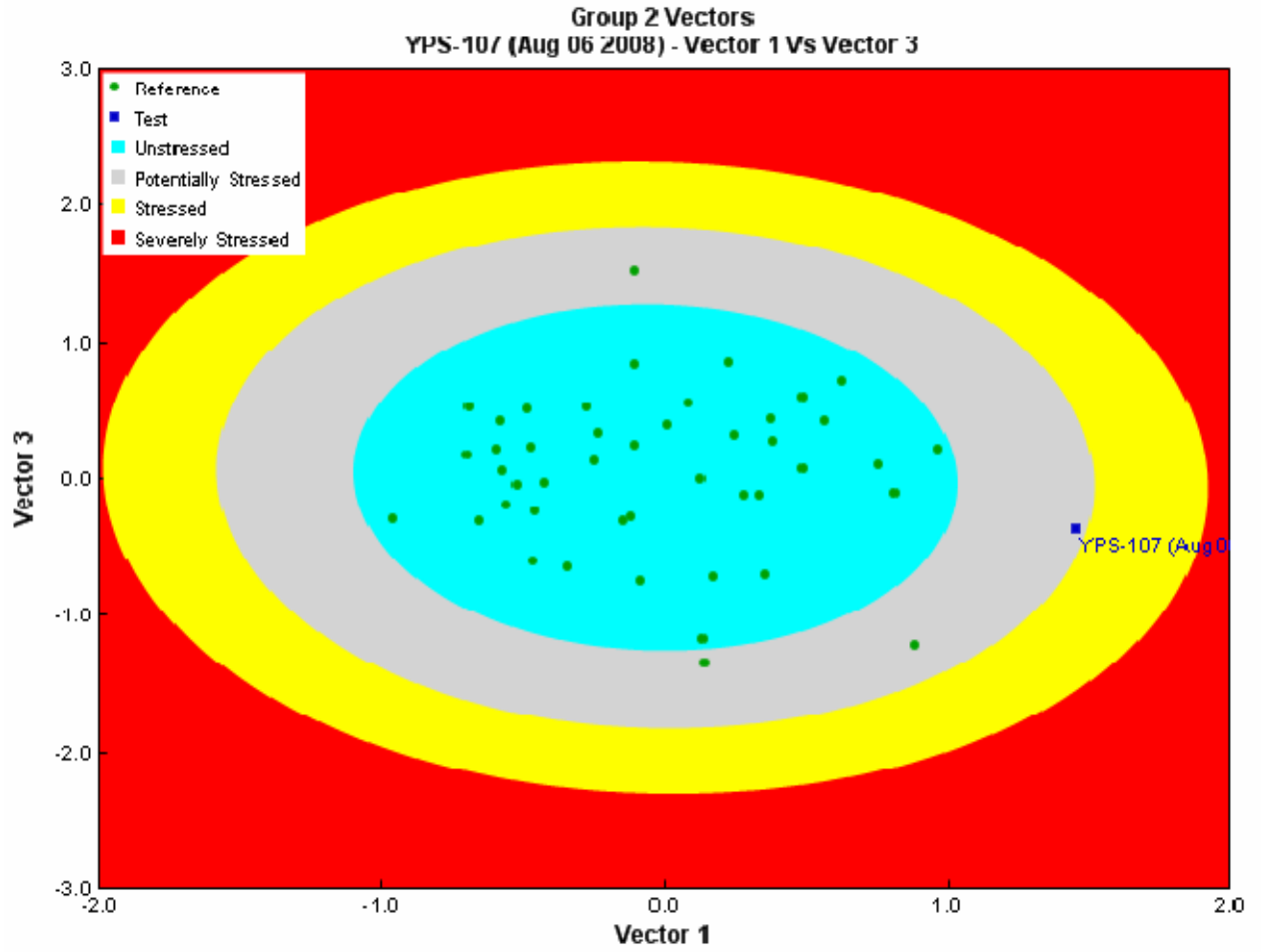
**RIVPACS Analysis**

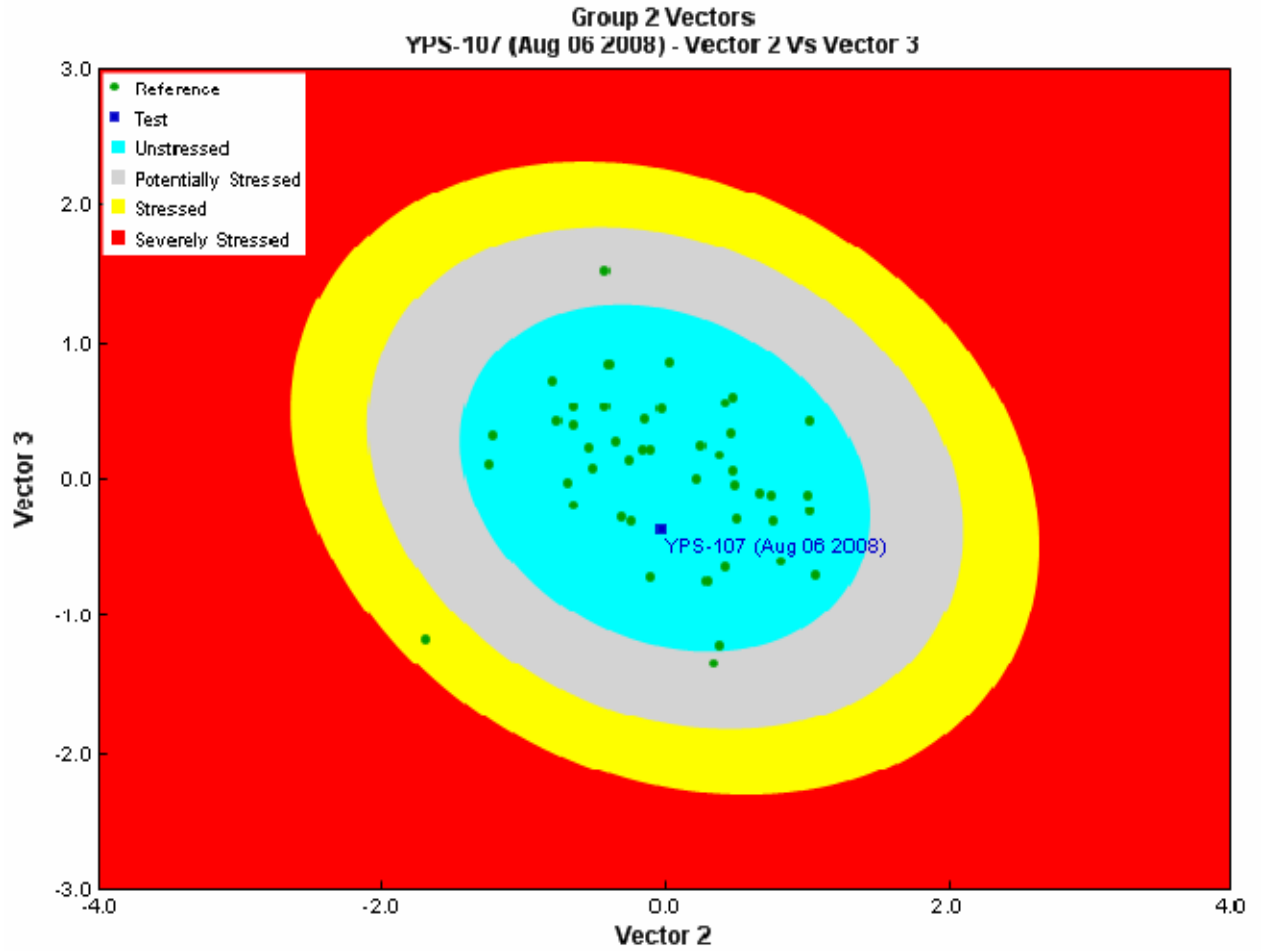
| Taxa          | Probability Of Occurrence | Abundance | Mean of Abundance for Reference site in Group 2 | SD of Abundance for Reference Site in Group 2 | Benthic Invertebrate Taxa Tolerance |             |
|---------------|---------------------------|-----------|---|---|-------------------------------------|-------------|
| Chironomidae  | 0.99                      | 67        | 153.3   | 61.2  | 6                                   | Insensitive |
| Simuliidae    | 0.67                      | 22        | 11.1  | 16.4  | 6                                   | Insensitive |
| Baetidae      | 0.66                      | 78        | 22.2  | 32.7  | 4                                   | Insensitive |
| Nemouridae    | 0.61                      | 68        | 9.2   | 14.0  | 2                                   | Sensitive   |
| Heptageniidae | 0.48                      | 33        | 9.0   | 14.9  | 4                                   | Insensitive |
| Tipulidae     | 0.43                      | 2         | 2.3   | 3.4   | 3                                   | Insensitive |
| Limnephilidae | 0.38                      | -         | 2.6   | 5.0   | 4                                   | Insensitive |

|                 |      |    |     |      |    |             |
|-----------------|------|----|-----|------|----|-------------|
| Sperchonidae    | 0.38 | 1  | 3.9 | 6.2  | 8  | Tolerant    |
| Empididae       | 0.35 | 25 | 2.3 | 4.5  | 6  | Insensitive |
| Chloroperlidae  | 0.31 | 10 | 6.0 | 21.9 | 1  | Sensitive   |
| Naididae        | 0.31 | 19 | 5.2 | 11.0 | 10 | Tolerant    |
| Lumbriculidae   | 0.29 | -  | 7.7 | 17.9 | 8  | Tolerant    |
| Ephemerellidae  | 0.28 | -  | 3.7 | 12.9 | 1  | Sensitive   |
| Ameletidae      | 0.25 | -  | 0.8 | 1.7  | 0  | Sensitive   |
| Capniidae       | 0.22 | 9  | 2.0 | 6.4  | 1  | Sensitive   |
| Ceratopogonidae | 0.22 | 1  | 5.1 | 29.8 | 6  | Insensitive |
| Rhyacophilidae  | 0.22 | -  | 1.6 | 3.6  | 0  | Sensitive   |
| Perlodidae      | 0.21 | -  | 0.9 | 2.0  | 2  | Sensitive   |
| Psychodidae     | 0.2  | -  | 0.5 | 1.4  | 10 | Tolerant    |

**Site Assessment Graphs**







**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   | 338.69    | 262.0                |                    |             |
| Total No. of Taxa | 13.0      | 10.4                 | 4.1                | 45          |

## Site Assessment Report

### Site Metadata

|              |                  |
|--------------|------------------|
| Site         | YPS-314          |
| Sample Date  | Jul 25 2008      |
| Latitude     | N 61° 18' 26.5"  |
| Longitude    | W 138° 33' 48.8" |
| Altitude     | 2828             |
| Feature Name | Cyr Creek        |
| Stream Order | 2                |

### Site Photograph

*Aerial*



### Context Map



### BEAST Prediction Results

|                               |  |          |          |          |
|-------------------------------|--|----------|----------|----------|
| <b>Predictor Variables</b>    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |          |          |          |
| <b>Predicted Group Number</b> | 1  |          |          |          |
| <b>Group</b>                  | <b>1</b>   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>Probability</b>            | 99.4%  | 0.4%     | 0.2%     | 0.0%     |

### Habitat Attributes

| Variable   | Site  | Reference Group Mean | Standard Deviation | Sample Size |
|--|-------|----------------------|--------------------|-------------|
| Canopy - % coverage (PercentRange)                     | 1     | 1.41                 | 0.792961           | 12          |
| Channel Depth - avg (cm)                               | 22.5  | 35.59                | 21.62038           | 11          |
| General - pH (pH)                                      | 7.3   | 7.8                  | 0.587259           | 53          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 280   | 181.85               | 116.1537           | 51          |
| General - Turbidity (NTU)                              | 0.5   | 0.41                 | 0                  | 1           |
| Landcover – Alpine (%)                                 | 42.3  | 27.8                 | 0.278192           | 53          |
| Landcover – Lake (%)                                   | 0     | 1.18                 | 0.033063           | 53          |
| Nitrogen - nitrate + nitrite (mg/L)                    | 0.07  | 0.062                |                    | 37          |
| Precip Rainfall JUN (mm) (mm)                          | 36.7  | 33.4                 | 6.066965           | 53          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 231.8 | 138.7                | 23.56304           | 53          |
| Solids - total suspended (TSS) (mg/L)                  | 0.5   | 9.19                 | 13.45555           | 42          |
| Substrate - embeddedness category (Category(1-5))      | 4     | 3.67                 | 1.073087           | 12          |
| Temperature - lake surface or stream (Degrees Celsius) | 7.82  | 9.95                 | 3.661989           | 53          |
| Velocity (Avg) (m/s)                                   | 0.32  | 0.51                 | 0.310606           | 53          |
| Width - Wetted (m)                                     | 4.1   | 5.86                 | 4.958505           | 53          |

**Bray-Curtis Analysis**

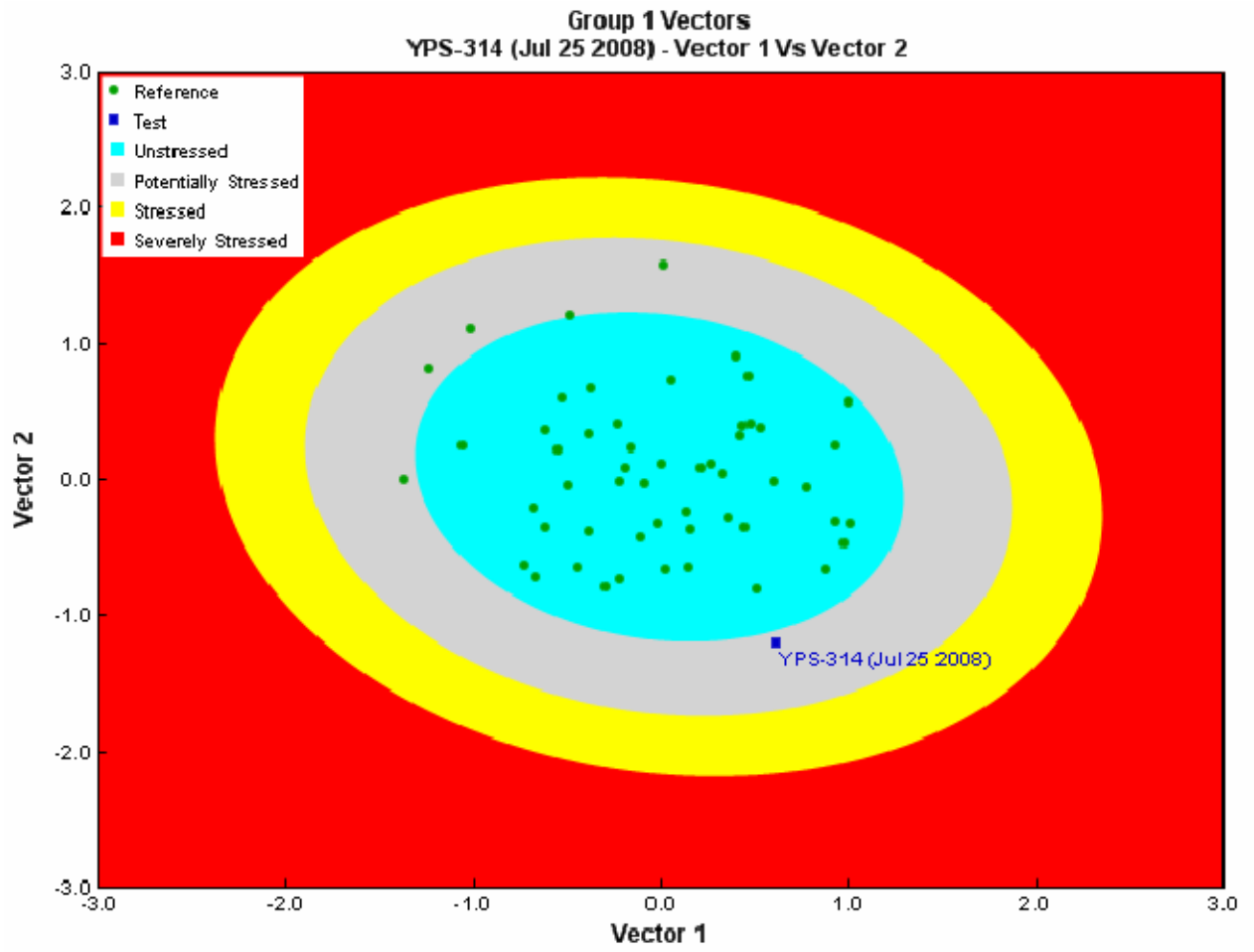
| Description                  | Value |
|------------------------------|-------|
| Bray-Curtis Distance         | 0.79  |
| Bray Curtis Reference Median | 429.5 |

**RIVPACS Analysis**

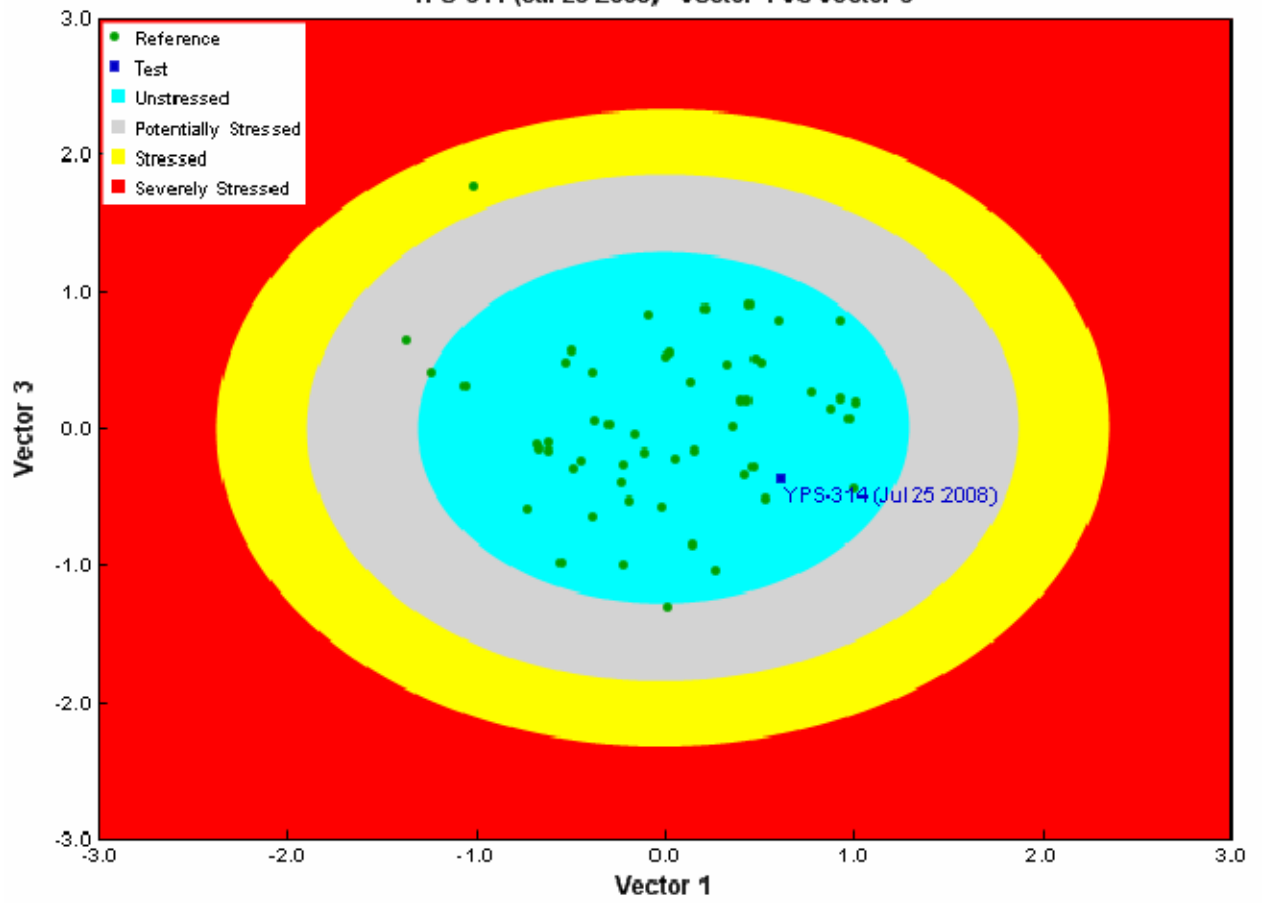
| Taxa            | Probability of Occurrence | 2008 Total Abundance | Mean of Abundance for Reference sites in Group 1 | SD of Abundance for Reference sites in Group 1 | Benthic Invertebrate Taxa Tolerance |             |
|-----------------|---------------------------|----------------------|--|--|-------------------------------------|-------------|
| Chironomidae    | 0.96                      | 481                  | 38.2   | 31.8   | 6                                   | Insensitive |
| Baetidae        | 0.9                       | 186                  | 46.8   | 58.2   | 4                                   | Insensitive |
| Simuliidae      | 0.85                      | 100                  | 26.7   | 44.5   | 6                                   | Insensitive |
| Nemouridae      | 0.81                      | 281                  | 19.9   | 31.8   | 2                                   | Sensitive   |
| Heptageniidae   | 0.75                      | 405                  | 39.2   | 53.4   | 4                                   | Insensitive |
| Limnephilidae   | 0.53                      | 5                    | 2.8  | 6.1  | 4                                   | Insensitive |
| Chloroperlidae  | 0.47                      | 19                   | 4.0  | 6.4  | 1                                   | Sensitive   |
| Empididae       | 0.47                      | 62                   | 2.2  | 5.6  | 6                                   | Insensitive |
| Ephemerellidae  | 0.47                      | 5                    | 6.4  | 14.9   | 1                                   | Sensitive   |
| Naididae        | 0.45                      | -                    | 5.6  | 12.8   | 10                                  | Tolerant    |
| Sperchonidae    | 0.43                      | 5                    | 1.9  | 3.3  | 8                                   | Tolerant    |
| Tipulidae       | 0.4                       | 5                    | 1.5  | 2.8  | 3                                   | Insensitive |
| Ameletidae      | 0.34                      | 100                  | 2.6  | 7.1  | 0                                   | Sensitive   |
| Rhyacophilidae  | 0.34                      | -                    | 2.2  | 5.1  | 0                                   | Sensitive   |
| Perlodidae      | 0.3                       | 5                    | 0.9  | 1.9  | 2                                   | Sensitive   |
| Ceratopogonidae | 0.25                      | -                    | 2.4  | 7.9  | 6                                   | Insensitive |
| Capniidae       | 0.19                      | -                    | 2.6  | 7.8  | 1                                   | Sensitive   |
| Glossosomatidae | 0.19                      | 5                    | 1.7  | 6.9  | 0                                   | Sensitive   |
| Hydropsychidae  | 0.19                      | 5                    | 0.9  | 2.4  | 4                                   | Insensitive |



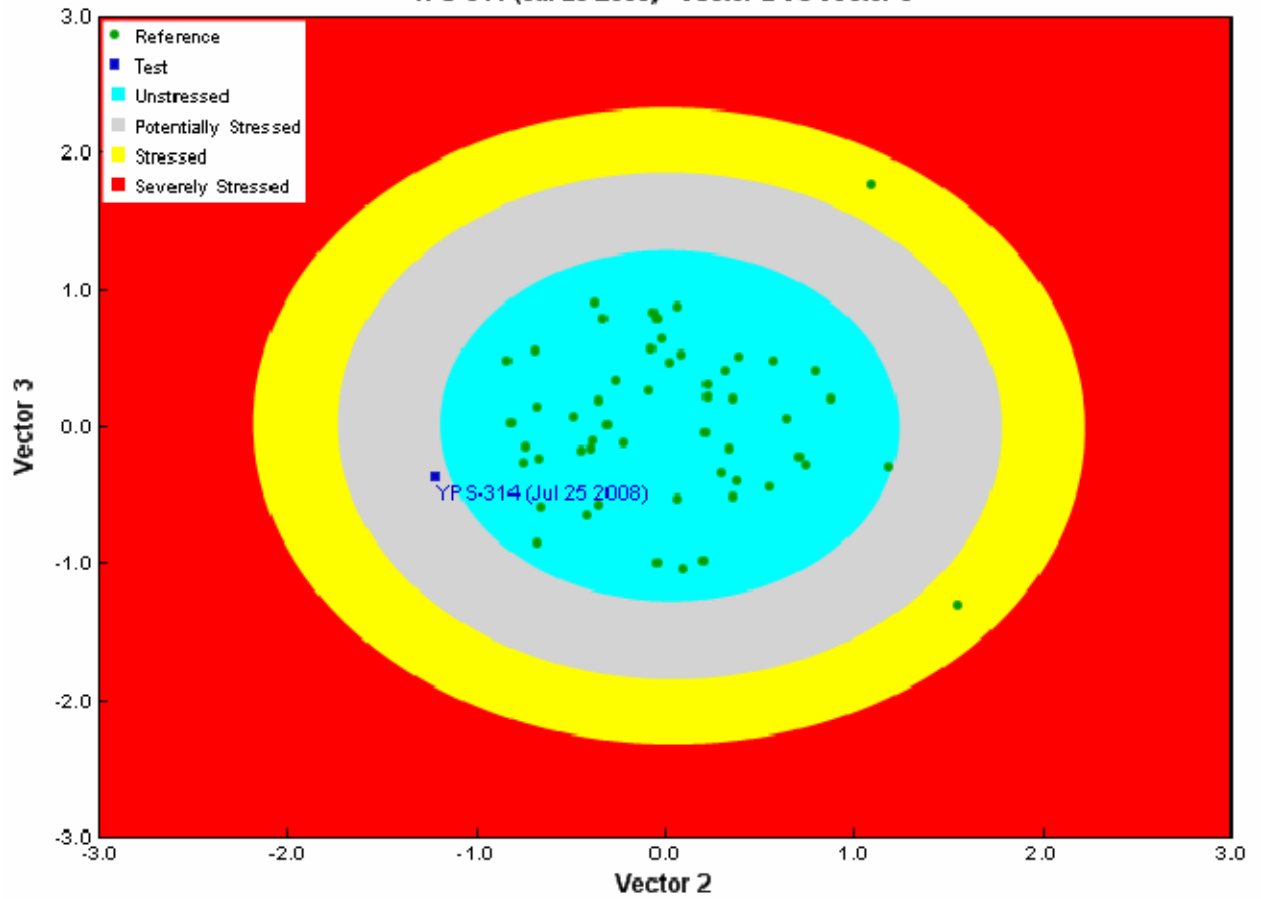
Site Assessment Graphs



Group 1 Vectors  
YPS-314 (Jul 25 2008) - Vector 1 Vs Vector 3



**Group 1 Vectors**  
**YPS-314 (Jul 25 2008) - Vector 2 Vs Vector 3**



**Site Assessment Vector Data**

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

**Site Metrics**

| Metric Name       | Test Site | Reference Group Mean | Standard Deviation | Sample Size |
|-------------------|-----------|----------------------|--------------------|-------------|
| Total Abundance   | 1666.58   | 226.1                |                    |             |
| Total No. of Taxa | 15.0      | 11.4                 | 4.1                | 53          |

# Site Assessment Report

## Site Metadata

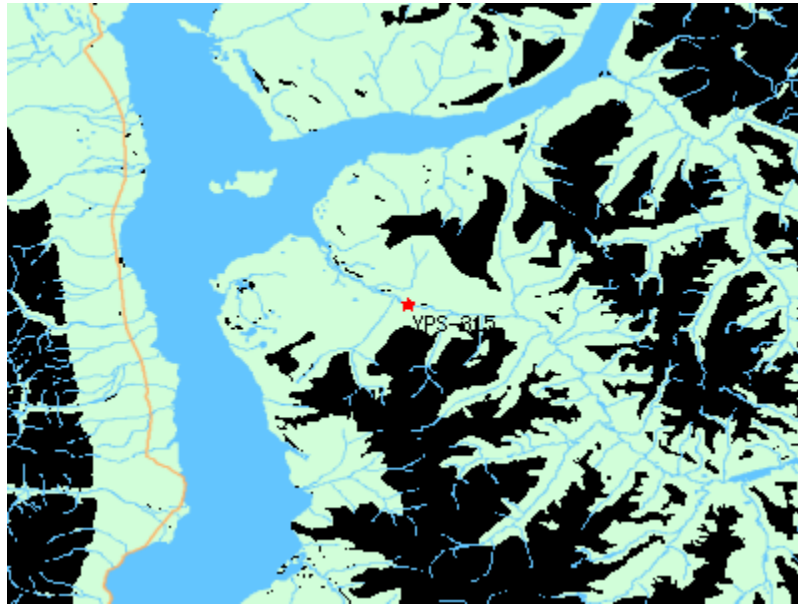
|              |                  |
|--------------|------------------|
| Site         | YPS-315          |
| Sample Date  | Jul 25 2008      |
| Latitude     | N 61° 18' 57.5"  |
| Longitude    | W 138° 33' 14.5" |
| Altitude     | 2828             |
| Feature Name | Gladstone Creek  |
| Stream Order | 3                |

## Site Photograph

*Aerial*



**Context Map**



**BEAST Prediction Results**

|                               |  |          |          |          |
|-------------------------------|--|----------|----------|----------|
| <b>Predictor Variables</b>    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |          |          |          |
| <b>Predicted Group Number</b> | 3  |          |          |          |
| <b>Group</b>                  | <b>1</b>   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>Probability</b>            | 30.5%  | 10.5%    | 53.7%    | 5.4%     |

**Habitat Attributes**

| Variable   | Site  | Reference Group Mean | Standard Deviation | Sample Size |
|--|-------|----------------------|--------------------|-------------|
| Canopy - % coverage (PercentRange)                     | 0     | 1.666667             | 1.556998           | 12          |
| Channel Depth - max (cm)                               | 65    | 28.17273             | 19.92637           | 11          |
| General - pH (pH)                                      | 7.6   | 7.573                | 0.639573           | 20          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 71.1  | 303.98               | 229.6363           | 15          |
| <b>General - Turbidity (NTU)</b>                       | 0.2   | <b>1361.9</b>        | <b>1985.965</b>    | <b>5</b>    |
| Landcover – Alpine (%)                                 | 89    | 0.326804             | 0.401358           | 20          |
| Landcover – Lake (%)                                   | 0.6   | 0.000318             | 0.000785           | 20          |
| <b>Nitrogen - nitrate + nitrite (mg/L)</b>             | 0.1   | <b>0.007</b>         |                    | <b>3</b>    |
| Precip Rainfall JUN (mm) (mm)                          | 36.7  | 38.895               | 3.282886           | 20          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 123.8 | 118.24               | 14.53766           | 20          |
| Solids - total suspended (TSS) (mg/L)                  | 0.2   | 828.5538             | 2261.856           | 13          |
| Substrate - embeddedness category (Category(1-5))      | 4     | 2.75                 | 0.866025           | 12          |
| Temperature - lake surface or stream (Degrees Celsius) | 9.2   | 8.462                | 2.811073           | 20          |
| Velocity (Avg) (m/s)                                   | 0.4   | 0.330116             | 0.167276           | 19          |
| Width - Wetted (m)                                     | 19.7  | 5.272                | 4.673739           | 20          |

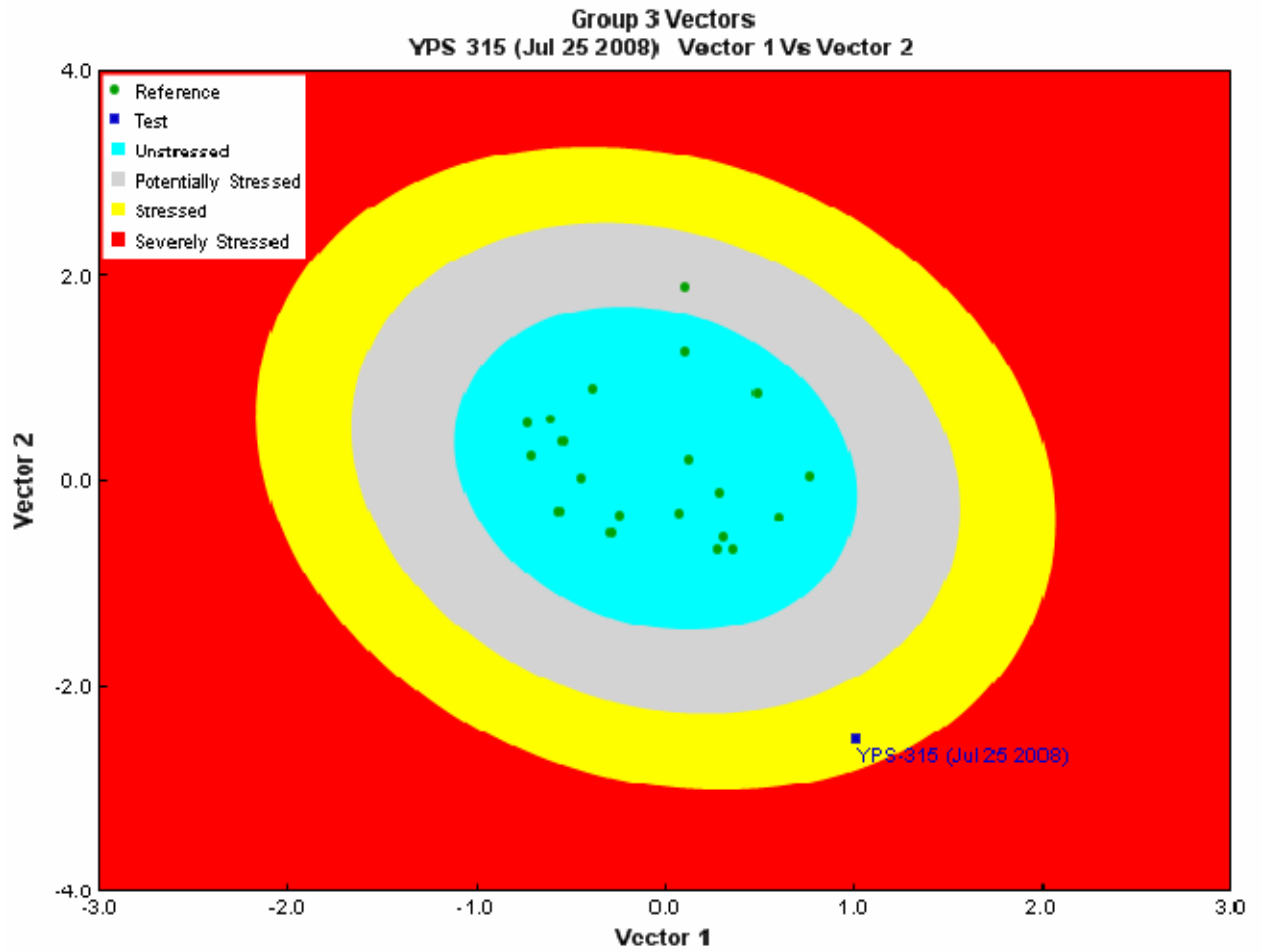
**Bray-Curtis Analysis**

| Description                  | Value |
|------------------------------|-------|
| Bray-Curtis Distance         | 0.95  |
| Bray Curtis Reference Median | 87.5  |

**RIVPACS Analysis**

| Taxa            | Probability of Occurrence | 2008 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    | 0.99                      | 195                  | 24.9   | 20.4   | 6                                   | Insensitive |
| Simuliidae      | 0.57                      | 42                   | 0.7  | 1.0  | 6                                   | Insensitive |
| Nemouridae      | 0.54                      | -                    | 1.0  | 1.8  | 2                                   | Sensitive   |
| Baetidae        | 0.51                      | 937                  | 0.5  | 1.2  | 4                                   | Insensitive |
| Heptageniidae   | 0.4                       | 463                  | 0.3  | 0.6  | 4                                   | Insensitive |
| Tipulidae       | 0.36                      | -                    | 0.6  | 1.2  | 3                                   | Insensitive |
| Naididae        | 0.32                      | -                    | 1.3  | 3.0  | 10                                  | Tolerant    |
| Chloroperlidae  | 0.3                       | 42                   | 0.4  | 1.0  | 1                                   | Sensitive   |
| Ephemerellidae  | 0.29                      | 16                   | 0.7  | 1.6  | 1                                   | Sensitive   |
| Limnephilidae   | 0.27                      | -                    | 0.1  | 0.4  | 4                                   | Insensitive |
| Sperchonidae    | 0.26                      | 21                   | 0.9  | 3.2  | 8                                   | Tolerant    |
| Ceratopogonidae | 0.24                      | -                    | 0.5  | 1.2  | 6                                   | Insensitive |
| Lumbriculidae   | 0.24                      | -                    | 2.2  | 4.6  | 8                                   | Tolerant    |
| Empididae       | 0.22                      | 11                   | 0.0  | 0.0  | 6                                   | Insensitive |
| Ameletidae      | 0.18                      | -                    | 0.1  | 0.2  | 0                                   | Sensitive   |
| Capniidae       | 0.18                      | -                    | 0.3  | 0.8  | 1                                   | Sensitive   |
| Psychodidae     | 0.18                      | -                    | 0.5  | 1.4  | 10                                  | Tolerant    |
| Rhyacophilidae  | 0.17                      | -                    | 0.1  | 0.2  | 0                                   | Sensitive   |
| Perlodidae      | 0.16                      | 21                   | 0.1  | 0.4  | 2                                   | Sensitive   |
| Lebertiidae     | 0.12                      | 5                    | 0.1  | 0.4  | 8                                   | Tolerant    |
| Dytiscidae      | 0.11                      | -                    | 0.1  | 0.3  | 5                                   | Insensitive |
| Leuctridae      | 0.1                       | -                    | 0.1  | 0.3  | 0                                   | Sensitive   |
| Corixidae       | 0.09                      | -                    | 0.2  | 0.5  |                                     |             |
| Sphaeriidae     | 0.08                      | -                    | 0.1  | 0.2  | 8                                   | Tolerant    |
| Glossosomatidae | 0.07                      | 5                    | 0.0  | 0.0  | 0                                   | Sensitive   |
| Brachycentridae | 0.06                      | 5                    | 0.0  | 0.0  | 1                                   | Sensitive   |

**Site Assessment Graphs**



**Site Assessment Vector Data**

| Assessment For The Test Site |          |
|------------------------------|----------|
| Vector 1 Vs Vector 2         | Stressed |
| Vector 1 Vs Vector 3         | N/A      |
| Vector 2 Vs Vector 3         | N/A      |
| Overall                      | Stressed |

**Site Metrics**

| Metric Name       | Test Site | Reference Group Mean | Standard Deviation | Sample Size |
|-------------------|-----------|----------------------|--------------------|-------------|
| Total Abundance   | 1763.04   | 36.5                 |                    |             |
| Total No. of Taxa | 12.0      | 5.1                  | 2.5                | 20          |

# Site Assessment Report

## Site Metadata

|              |                  |
|--------------|------------------|
| Site         | YPS-316          |
| Sample Date  | Jul 28 2008      |
| Latitude     | N 61° 59' 6.4"   |
| Longitude    | W 137° 11' 21.7" |
| Altitude     | 3028             |
| Feature Name | Nansen Creek     |
| Stream Order | 3                |

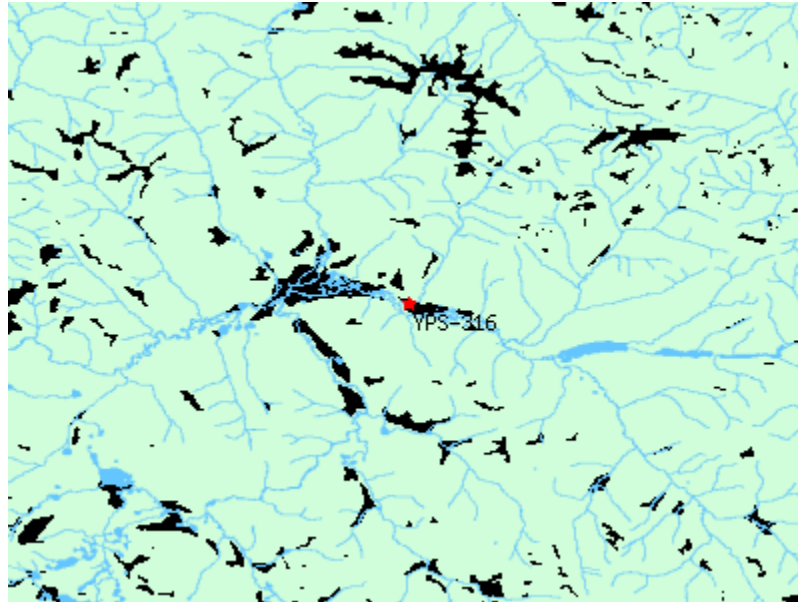
## Site Photograph

*Aerial*



## Context Map





**BEAST Prediction Results**

|                               |  |          |          |          |
|-------------------------------|--|----------|----------|----------|
| <b>Predictor Variables</b>    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |          |          |          |
| <b>Predicted Group Number</b> | 2  |          |          |          |
| <b>Group</b>                  | <b>1</b>   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>Probability</b>            | 16.4%  | 42.8%    | 27.2%    | 13.6%    |

**Habitat Attributes**

| Variable   | Site  | Reference Group Mean | Standard Deviation | Sample Size |
|--|-------|----------------------|--------------------|-------------|
| Canopy - % coverage (Percent Range)                    | 1     | 1.666667             | 1.073087           | 12          |
| Channel Depth - max (cm)                               | 24    | 31.45833             | 18.58941           | 12          |
| General - pH (pH)                                      | 7.2   | 7.651333             | 0.808761           | 45          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 192   | 239.05               | 134.161            | 44          |
| <b>General - Turbidity (NTU)</b>                       | 3.9   | <b>27.0025</b>       | <b>44.68459</b>    | <b>4</b>    |
| Landcover – Alpine (%)                                 | 14    | 0.143083             | 0.219036           | 45          |
| Landcover – Lake (%)                                   | 0     | 0.00565              | 0.014997           | 45          |
| <b>Nitrogen - nitrate + nitrite (mg/L)</b>             | 0.05  | 0.090714             |                    | 21          |
| Precip Rainfall JUN (mm) (mm)                          | 33.7  | 36.99778             | 7.555326           | 45          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 114.8 | 129.6067             | 19.21532           | 45          |
| Solids - total suspended (TSS) (mg/L)                  | 3.9   | 11.17838             | 30.64302           | 37          |
| Substrate - embeddedness category (Category(1-5))      | 4     | 3.666667             | 0.778499           | 12          |
| Temperature - lake surface or stream (Degrees Celsius) | 5.16  | 10.41333             | 3.98499            | 45          |
| Velocity (Avg) (m/s)                                   | 0.88  | 0.3616               | 0.227003           | 45          |
| Width - Wetted (m)                                     | 2.8   | 5.386667             | 3.792933           | 45          |

**Bray-Curtis Analysis**

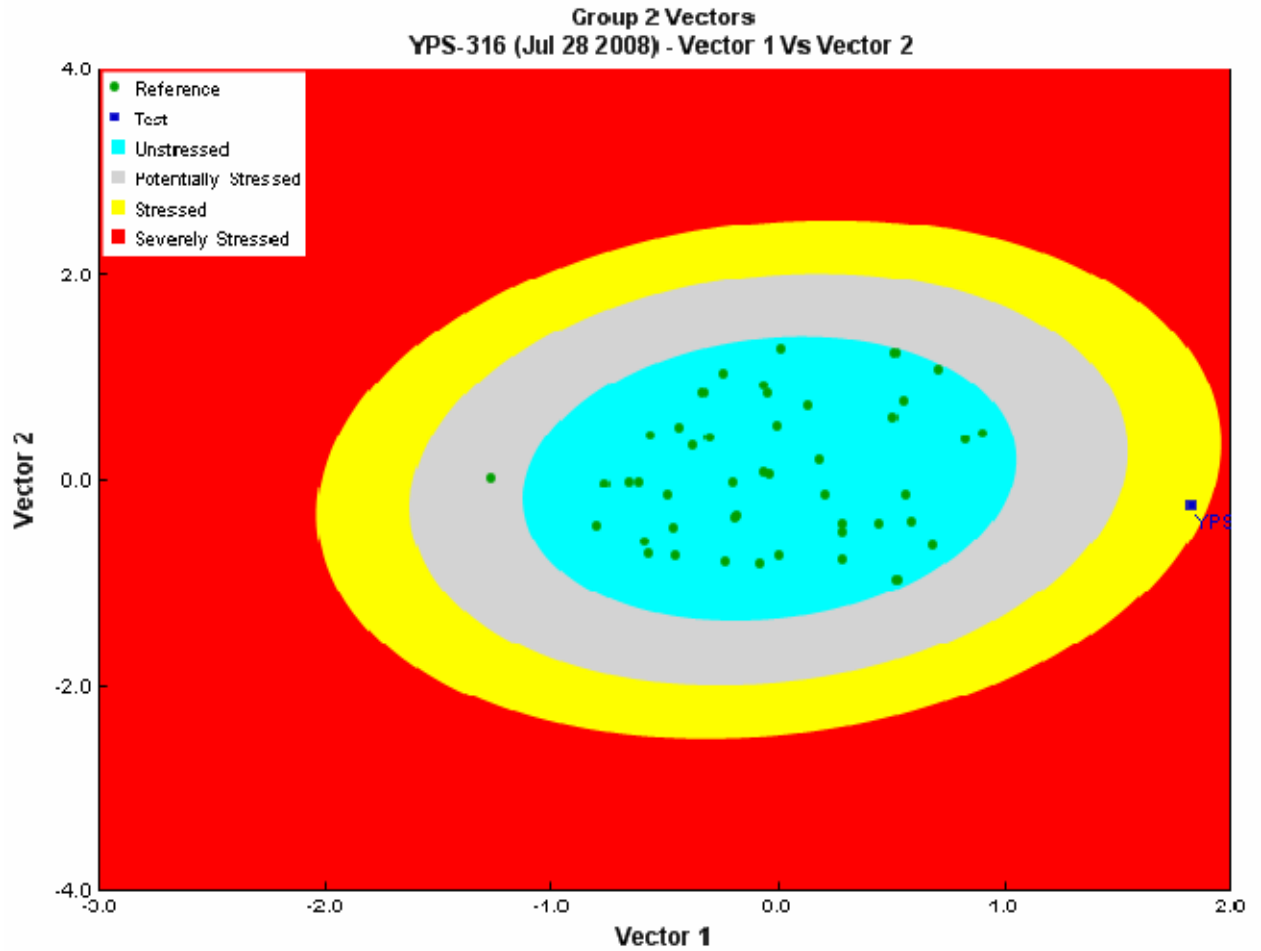
| Description                  | Value  |
|------------------------------|--------|
| Bray-Curtis Distance         | 0.5    |
| Bray Curtis Reference Median | 465.94 |

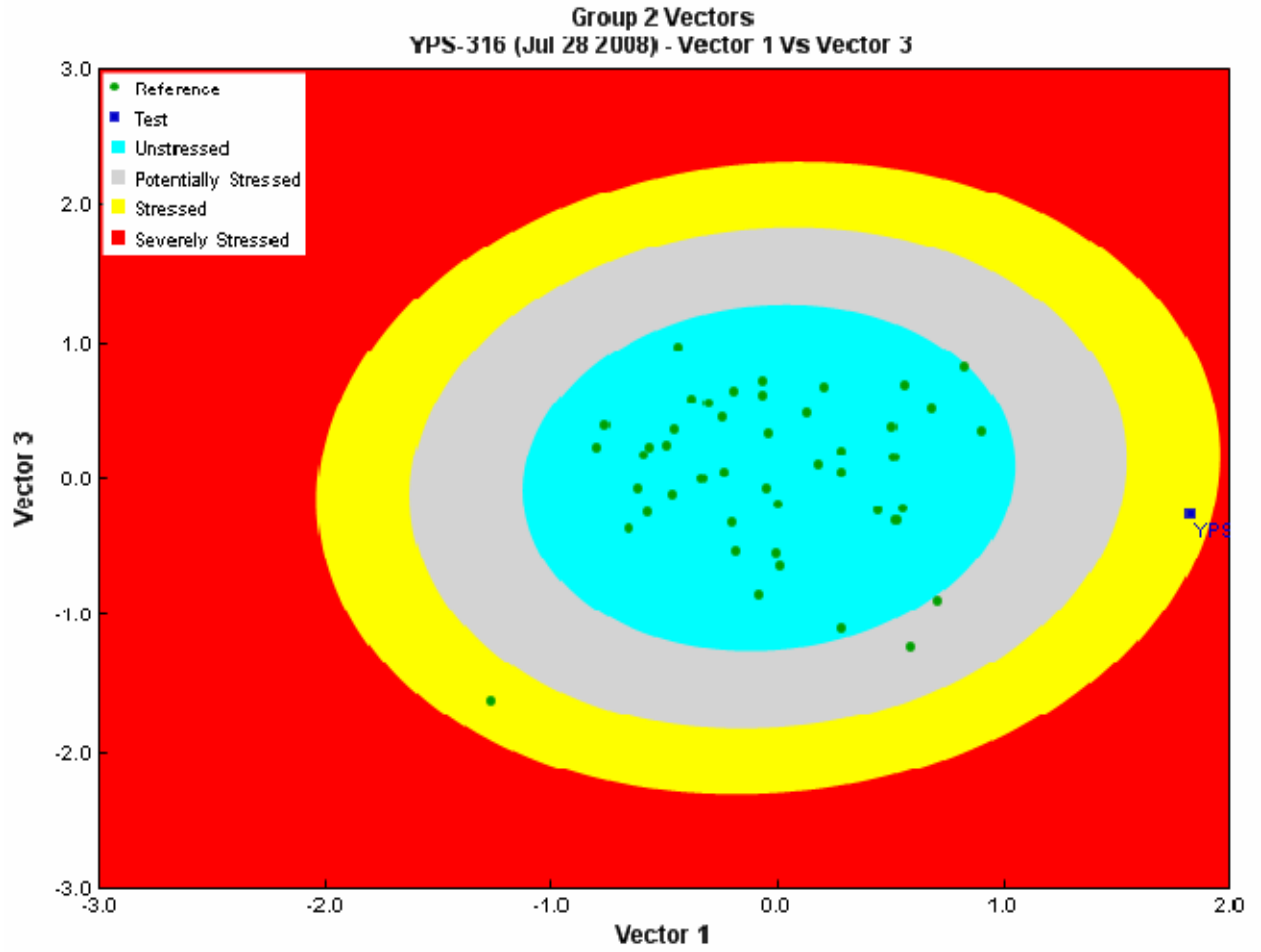
**RIVPACS Analysis**

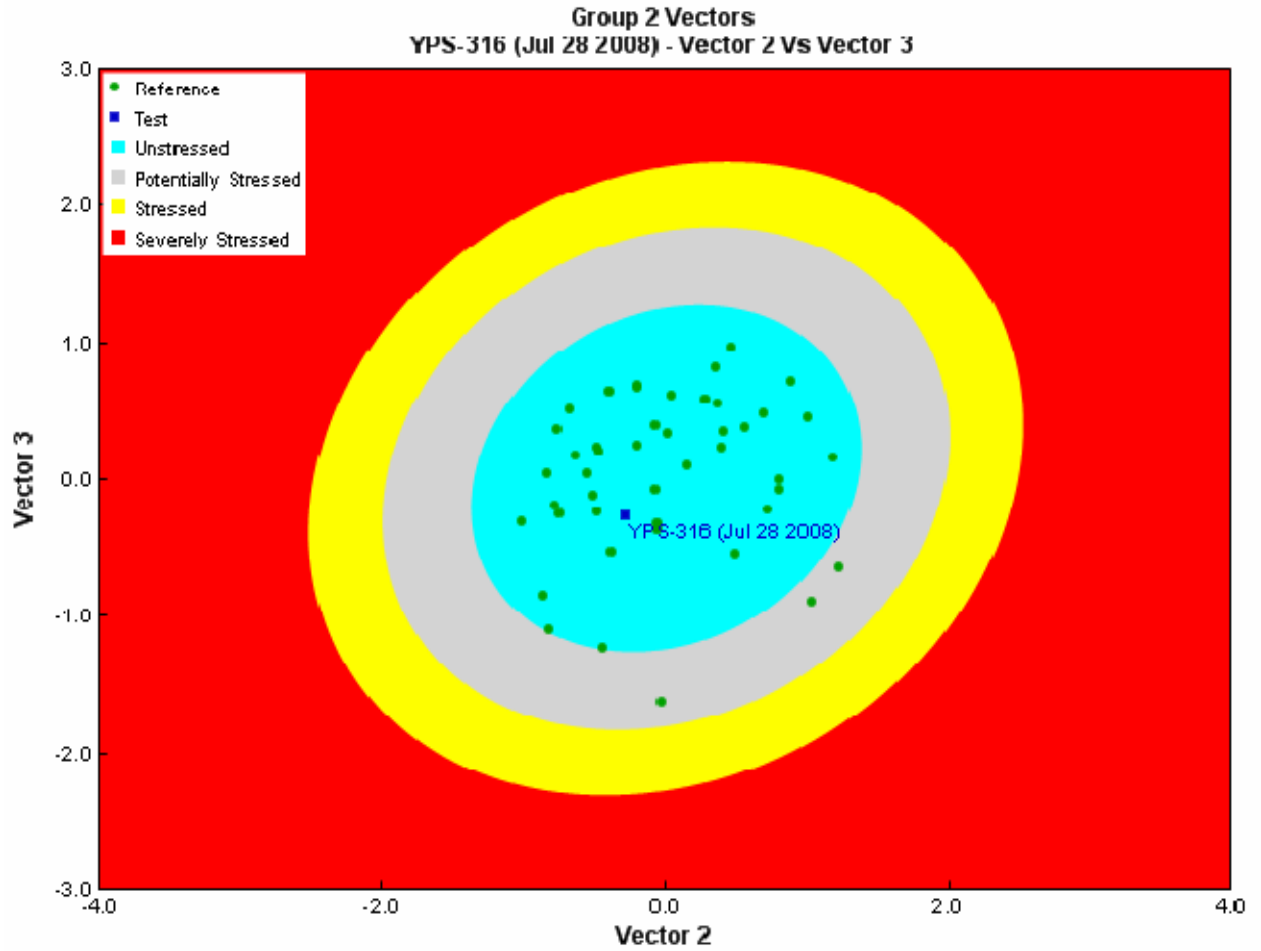
| Taxa            | Probability of Occurrence | 2008 Total Abundance | Mean of Abundance for Reference sites in Group 2 | SD of Abundance for Reference sites in Group 2 | Benthic Invertebrate Taxa Tolerance |             |
|-----------------|---------------------------|----------------------|--|--|-------------------------------------|-------------|
| Chironomidae    | 1                         | 68                   | 153.3  | 61.2   | 6                                   | Insensitive |
| Simuliidae      | 0.73                      | 114                  | 11.1   | 16.4   | 6                                   | Insensitive |
| Baetidae        | 0.71                      | 242                  | 22.2   | 32.7   | 4                                   | Insensitive |
| Nemouridae      | 0.65                      | -                    | 9.2  | 14.0   | 2                                   | Sensitive   |
| Chironomidae    | 0.53                      | 4                    | 9.0  | 14.9   | 4                                   | Insensitive |
| Tipulidae       | 0.45                      | 2                    | 2.3  | 3.4  | 3                                   | Insensitive |
| Empididae       | 0.41                      | 19                   | 2.3  | 4.5  | 6                                   | Insensitive |
| Limnephilidae   | 0.38                      | 1                    | 2.6  | 5.0  | 4                                   | Insensitive |
| Sperchonidae    | 0.37                      | 7                    | 3.9  | 6.2  | 8                                   | Tolerant    |
| Chloroperlidae  | 0.31                      | -                    | 6.0  | 21.9   | 1                                   | Sensitive   |
| Ameletidae      | 0.28                      | -                    | 0.8  | 1.7  | 0                                   | Sensitive   |
| Capniidae       | 0.28                      | -                    | 2.0  | 6.4  | 1                                   | Sensitive   |
| Lumbriculidae   | 0.28                      | 2                    | 7.7  | 17.9   | 8                                   | Tolerant    |
| Naididae        | 0.27                      | -                    | 5.2  | 11.0   | 10                                  | Tolerant    |
| Ephemerellidae  | 0.26                      | -                    | 3.7  | 12.9   | 1                                   | Sensitive   |
| Perlodidae      | 0.24                      | 9                    | 0.9  | 2.0  | 2                                   | Sensitive   |
| Lebertiidae     | 0.23                      | 7                    | 1.8  | 4.4  | 8                                   | Tolerant    |
| Psychodidae     | 0.21                      | -                    | 0.5  | 1.4  | 10                                  | Tolerant    |
| Rhyacophilidae  | 0.21                      | -                    | 1.6  | 3.6  | 0                                   | Sensitive   |
| Ceratopogonidae | 0.19                      | -                    | 5.1  | 29.8   | 6                                   | Insensitive |
| Dytiscidae      | 0.12                      | -                    | 0.6  | 1.7  | 5                                   | Insensitive |
| Glossosomatidae | 0.1                       | -                    | 1.2  | 4.6  | 0                                   | Sensitive   |
| Brachycentridae | 0.09                      | 7                    | 0.8  | 2.8  | 1                                   | Sensitive   |
| Sphaeriidae     | 0.09                      | -                    | 0.6  | 2.5  | 8                                   | Tolerant    |
| Leuctridae      | 0.08                      | -                    | 0.6  | 2.3  | 0                                   | Sensitive   |
| Lymnaeidae      | 0.07                      | -                    | 0.1  | 0.5  | 6                                   | Insensitive |
| Corixidae       | 0.06                      | -                    | 0.0  | 0.2  |                                     |             |
| Leptophlebiidae | 0.06                      | -                    | 0.4  | 2.4  | 2                                   | Sensitive   |
| Muscidae        | 0.06                      | -                    | 0.0  | 0.3  | 6                                   | Insensitive |
| Valvatidae      | 0.06                      | -                    | 1.3  | 4.5  | 8                                   | Tolerant    |
| Dixidae         | 0.05                      | -                    | 0.2  | 1.2  | 1                                   | Sensitive   |
| Hydropsychidae  | 0.05                      | -                    | 0.2  | 0.9  | 4                                   | Insensitive |
| Hydroptilidae   | 0.05                      | -                    | 0.3  | 1.2  | 4                                   | Insensitive |
| Physidae        | 0.05                      | -                    | 0.1  | 0.4  | 8                                   | Tolerant    |
| Planorbidae     | 0.04                      | -                    | 0.7  | 4.5  | 7                                   | Tolerant    |

|              |      |   |     |     |   |           |
|--------------|------|---|-----|-----|---|-----------|
| Uenoidae     | 0.04 | - | 0.0 | 0.3 | 0 | Sensitive |
| Apataniidae  | 0.03 | - | 0.3 | 1.2 | 1 | Sensitive |
| Hyalellidae  | 0.03 | - | 0.1 | 0.3 | 8 | Tolerant  |
| Hydrozetidae | 0.03 | 1 | 0.0 | 0.0 |   |           |
| Hygrobatidae | 0.03 | 1 | 0.6 | 3.4 | 8 | Tolerant  |

Site Assessment Graphs







**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   | 484.0     | 262.0                |                    |             |
| Total No. of Taxa | 14.0      | 10.4                 | 4.1                | 45          |

## Site Assessment Report

### Site Metadata

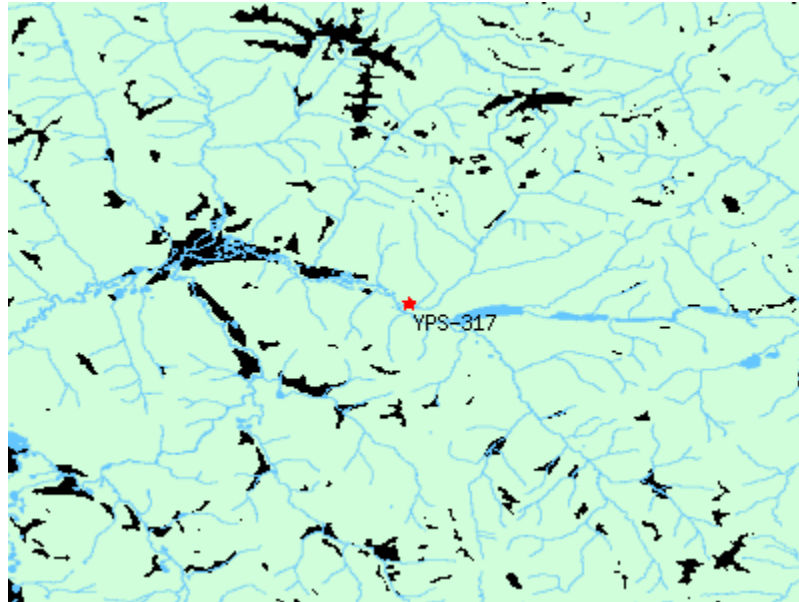
|              |                 |
|--------------|-----------------|
| Site         | YPS-317         |
| Sample Date  | Jul 28 2008     |
| Latitude     | N 61° 59' 49.9" |
| Longitude    | W 137° 4' 46"   |
| Altitude     | 3080            |
| Feature Name | Victoria Creek  |
| Stream Order | 4               |

### Site Photograph

*Aerial*



### Context Map



**BEAST Prediction Results**

|                               |  |          |          |          |
|-------------------------------|--|----------|----------|----------|
| <b>Predictor Variables</b>    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |          |          |          |
| <b>Predicted Group Number</b> | 2  |          |          |          |
| <b>Group</b>                  | <b>1</b>   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>Probability</b>            | 16.0%  | 43.1%    | 27.7%    | 13.1%    |

**Habitat Attributes**

| Variable   | Site  | Reference Group Mean | Standard Deviation | Sample Size |
|--|-------|----------------------|--------------------|-------------|
| Canopy - % coverage (PercentRange)                     | 1     | 1.666667             | 1.073087           | 12          |
| Channel Depth - avg (cm)                               | 24    | 31.45833             | 18.58941           | 12          |
| General - pH (pH)                                      | 8     | 7.651333             | 0.808761           | 45          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 198.6 | 239.05               | 134.161            | 44          |
| General - Turbidity (NTU)                              | 1.5   | 27.0025              | 44.68459           | 4           |
| Landcover – Alpine (%)                                 | 15.4  | 0.143083             | 0.219036           | 45          |
| Landcover – Lake (%)                                   | 0     | 0.00565              | 0.014997           | 45          |
| Nitrogen - nitrate + nitrite (mg/L)                    | 0.06  | 0.090714             |                    | 21          |
| Precip Rainfall JUN (mm) (mm)                          | 33.7  | 36.99778             | 7.555326           | 45          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 114.8 | 129.6067             | 19.21532           | 45          |
| Solids - total suspended (TSS) (mg/L)                  | 1.5   | 11.17838             | 30.64302           | 37          |
| Substrate - embeddedness category (Category(1-5))      | 4     | 3.666667             | 0.778499           | 12          |
| Temperature - lake surface or stream (Degrees Celsius) | 7.76  | 10.41333             | 3.98499            | 45          |
| Velocity (Avg) (m/s)                                   | 0.56  | 0.3616               | 0.227003           | 45          |
| Width - Wetted (m)                                     | 4.4   | 5.386667             | 3.792933           | 45          |

**Bray-Curtis Analysis**

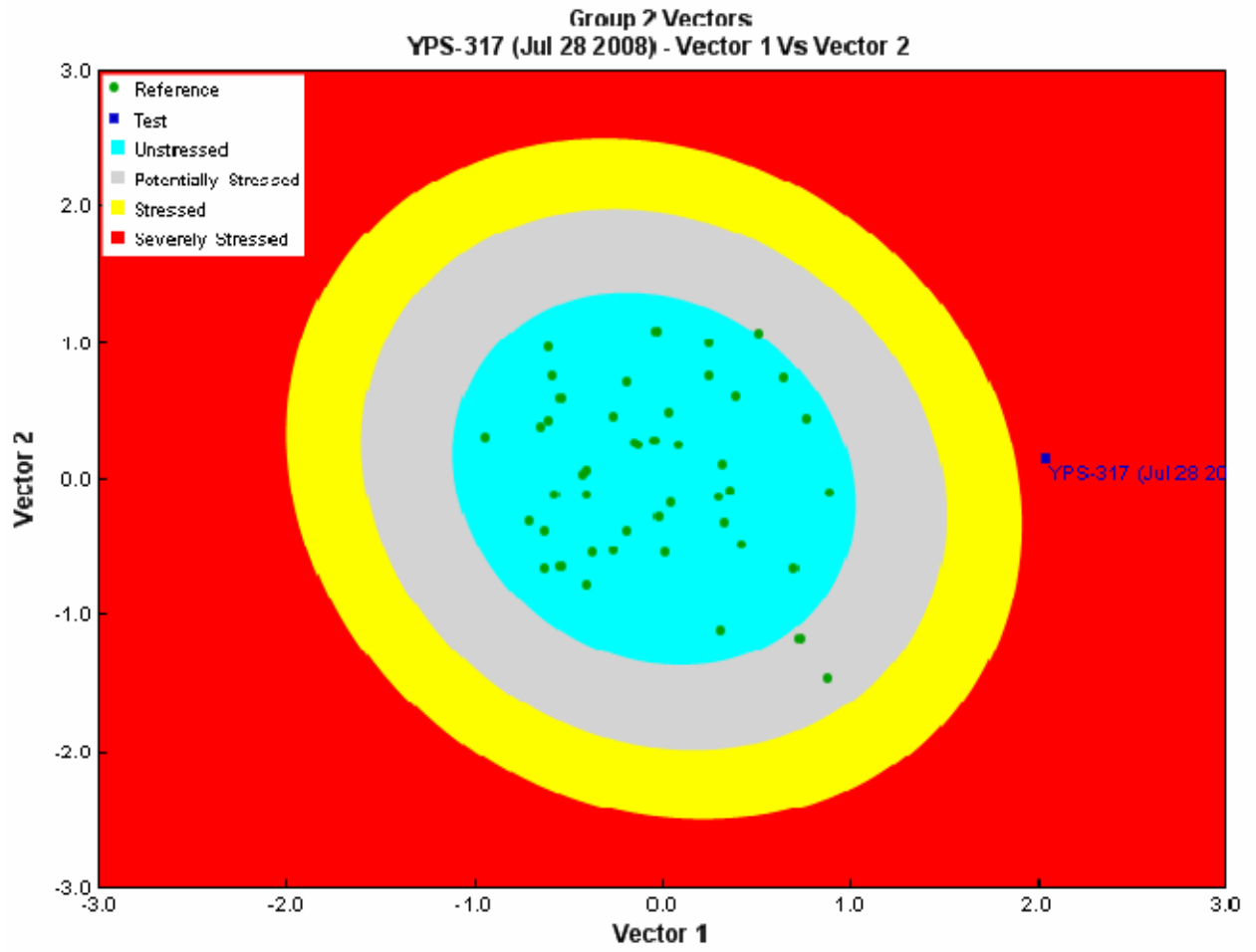
| Description                  | Value  |
|------------------------------|--------|
| Bray-Curtis Distance         | 0.82   |
| Bray Curtis Reference Median | 465.94 |

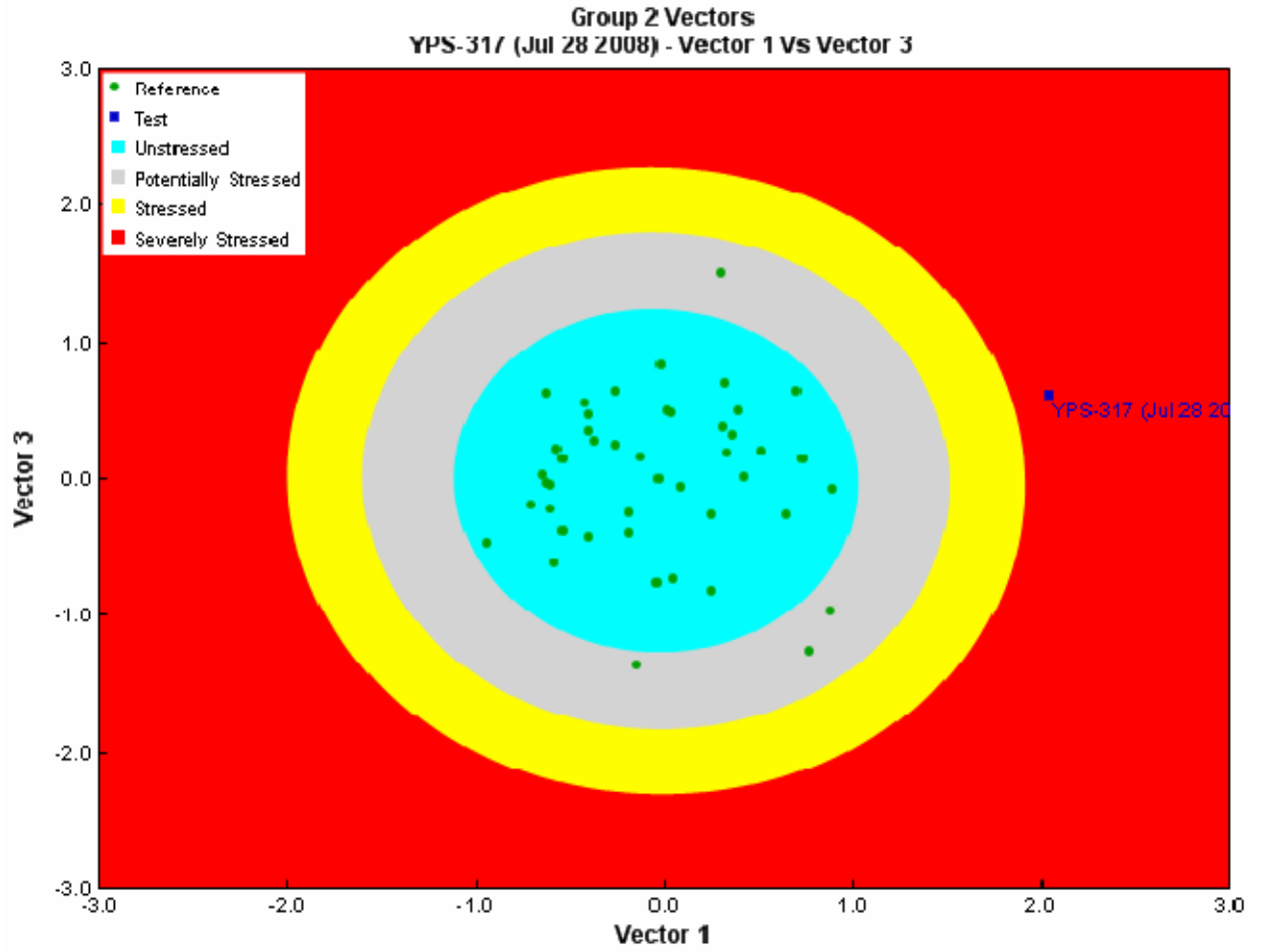
**RIVPACS Analysis**

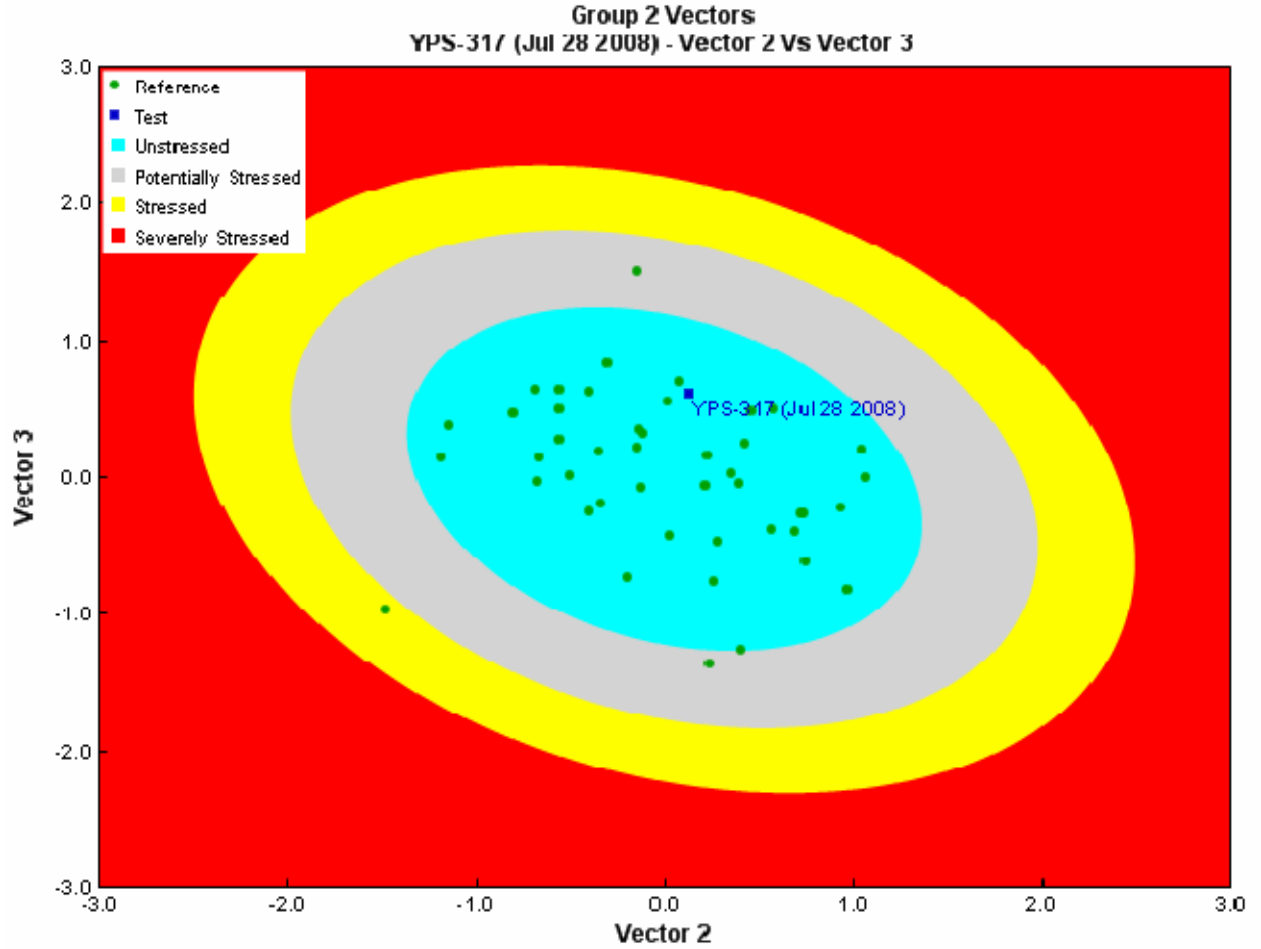
| Taxa            | Probability of Occurrence | 2008 Total Abundance | Mean of Abundance for Reference sites in Group 2 | SD of Abundance for Reference sites in Group 2 | Benthic Invertebrate Taxa Tolerance |             |
|-----------------|---------------------------|----------------------|--|--|-------------------------------------|-------------|
| Chironomidae    | 1                         | 120                  | 153.3  | 61.2   | 6                                   | Insensitive |
| Simuliidae      | 0.72                      | 296                  | 11.1   | 16.4   | 6                                   | Insensitive |
| Baetidae        | 0.71                      | 688                  | 22.2   | 32.7   | 4                                   | Insensitive |
| Nemouridae      | 0.65                      | -                    | 9.2  | 14.0   | 2                                   | Sensitive   |
| Heptageniidae   | 0.53                      | 32                   | 9.0  | 14.9   | 4                                   | Insensitive |
| Tipulidae       | 0.45                      | -                    | 2.3  | 3.4  | 3                                   | Insensitive |
| Empididae       | 0.4                       | 44                   | 2.3  | 4.5  | 6                                   | Insensitive |
| Limnephilidae   | 0.37                      | 4                    | 2.6  | 5.0  | 4                                   | Insensitive |
| Sperchonidae    | 0.37                      | 8                    | 3.9  | 6.2  | 8                                   | Tolerant    |
| Chloroperlidae  | 0.31                      | -                    | 6.0  | 21.9   | 1                                   | Sensitive   |
| Ameletidae      | 0.28                      | -                    | 0.8  | 1.7  | 0                                   | Sensitive   |
| Capniidae       | 0.28                      | -                    | 2.0  | 6.4  | 1                                   | Sensitive   |
| Lumbriculidae   | 0.28                      | -                    | 7.7  | 17.9   | 8                                   | Tolerant    |
| Naididae        | 0.27                      | -                    | 5.2  | 11.0   | 10                                  | Tolerant    |
| Ephemerellidae  | 0.26                      | 32                   | 3.7  | 12.9   | 1                                   | Sensitive   |
| Perlodidae      | 0.24                      | 12                   | 0.9  | 2.0  | 2                                   | Sensitive   |
| Lebertiidae     | 0.23                      | -                    | 1.8  | 4.4  | 8                                   | Tolerant    |
| Psychodidae     | 0.21                      | -                    | 0.5  | 1.4  | 10                                  | Tolerant    |
| Rhyacophilidae  | 0.21                      | -                    | 1.6  | 3.6  | 0                                   | Sensitive   |
| Ceratopogonidae | 0.19                      | -                    | 5.1  | 29.8   | 6                                   | Insensitive |
| Dytiscidae      | 0.12                      | -                    | 0.6  | 1.7  | 5                                   | Insensitive |
| Glossosomatidae | 0.1                       | -                    | 1.2  | 4.6  | 0                                   | Sensitive   |
| Brachycentridae | 0.09                      | 24                   | 0.8  | 2.8  | 1                                   | Sensitive   |



**Site Assessment Graphs**







**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         | Unstressed        |
| Overall                      | Severely Stressed |

**Site Metrics**

| Metric Name       | Test Site | Reference Group Mean | Standard Deviation | Sample Size |
|-------------------|-----------|----------------------|--------------------|-------------|
| Total Abundance   | 1264.0    | 262.0                |                    |             |
| Total No. of Taxa | 11.0      | 10.4                 | 4.1                | 45          |

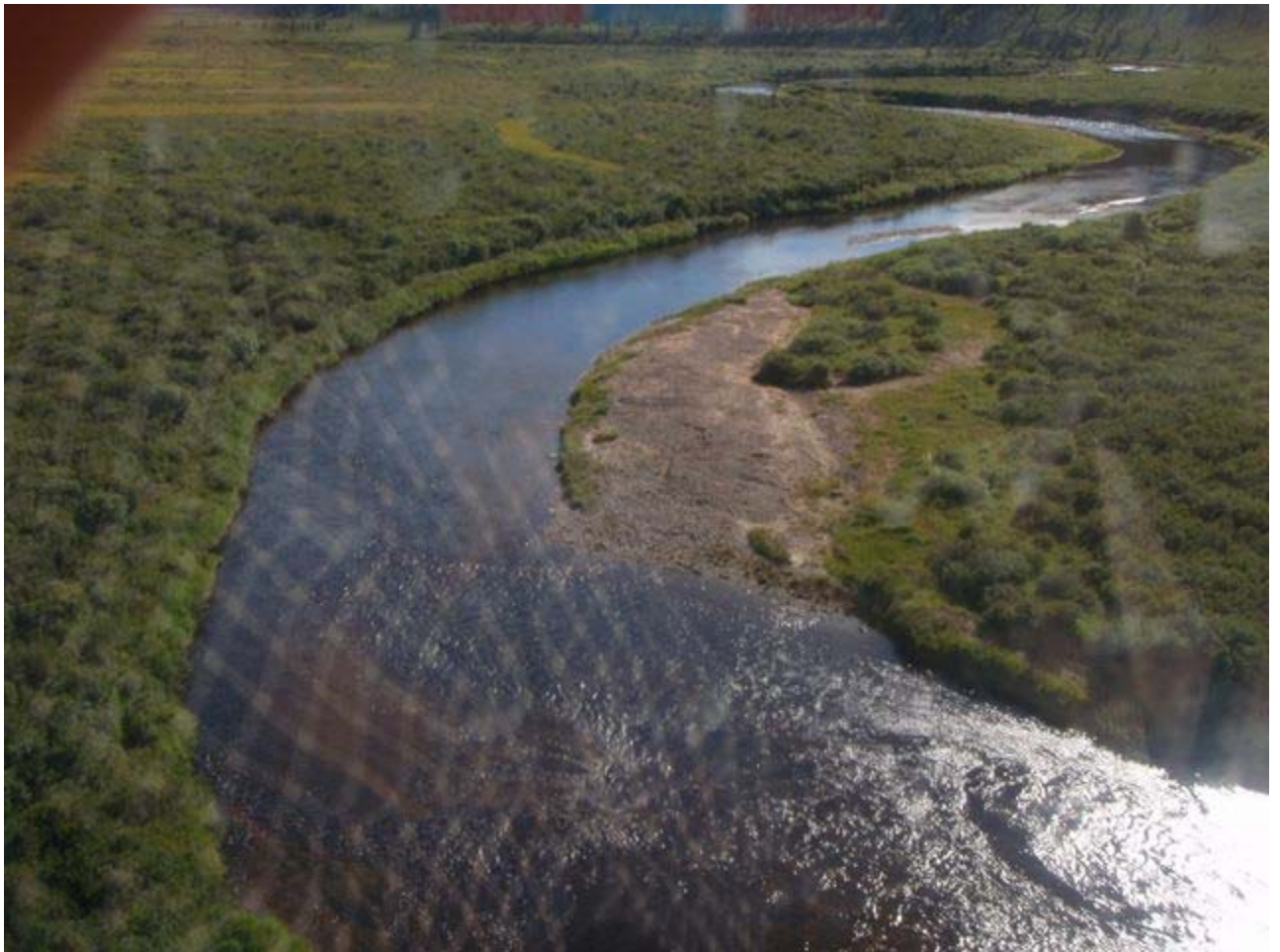
## Site Assessment Report

### Site Metadata

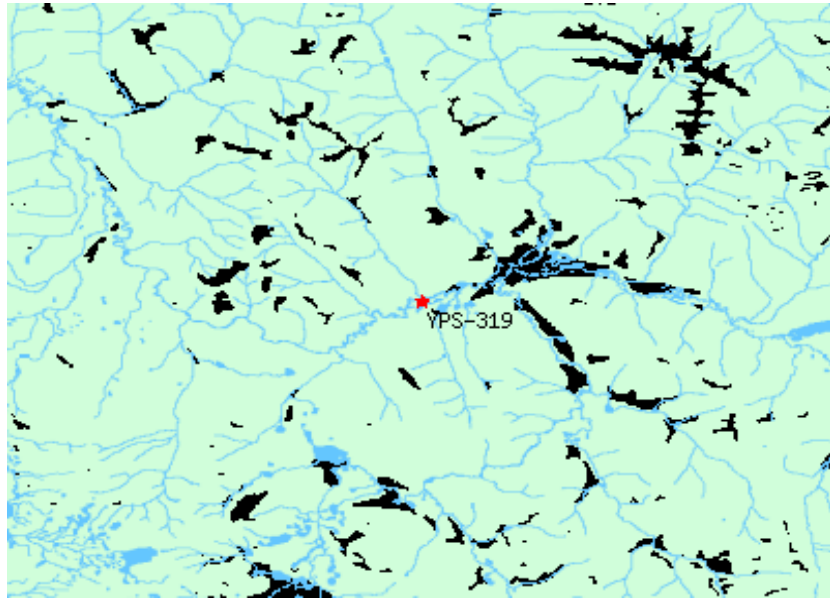
|              |                  |
|--------------|------------------|
| Site         | YPS-319          |
| Sample Date  | Jul 28 2008      |
| Latitude     | N 61° 55' 3.5"   |
| Longitude    | W 137° 19' 55.5" |
| Altitude     | 3014             |
| Feature Name | Nisling River    |
| Stream Order | 5                |

### Site Photograph

*Aerial*



**Context Map**



**BEAST Prediction Results**

|                               |  |          |          |          |
|-------------------------------|--|----------|----------|----------|
| <b>Predictor Variables</b>    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |          |          |          |
| <b>Predicted Group Number</b> | 4  |          |          |          |
| <b>Group</b>                  | <b>1</b>   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>Probability</b>            | 3.2%   | 25.2%    | 13.2%    | 58.4%    |

**Habitat Attributes**

| Variable   | Site  | Reference Group Mean | Standard Deviation | Sample Size |
|--|-------|----------------------|--------------------|-------------|
| Canopy - % coverage (Percent Range)                    | 1     | 1.516129             | 1.179575           | 31          |
| Channel Depth - avg (cm)                               | 90    | 26.74793             | 19.12511           | 29          |
| General - pH (pH)                                      | 7.2   | 7.81025              | 0.629475           | 40          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 110.1 | 251.6188             | 183.3222           | 32          |
| General - Turbidity (NTU)                              | 0.7   | 1.467333             | 3.130127           | 15          |
| Landcover – Alpine (%)                                 | 12.8  | 0.311484             | 0.321628           | 40          |
| Landcover – Lake (%)                                   | 0.4   | 0.006318             | 0.022385           | 40          |
| Nitrogen – nitrate+Nitrite (mg/L)                      |       | 0.0019               |                    | 1           |
| Precip Rainfall JUN (mm) (mm)                          | 45    | 42.56                | 8.344591           | 40          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 121.3 | 123.515              | 13.76934           | 40          |
| Solids - total suspended (TSS) (mg/L)                  | 0.7   | 5.9704               | 6.025369           | 25          |
| Substrate - embeddedness category (Category(1-5))      | 4     | 3.870968             | 0.884757           | 31          |
| Temperature - lake surface or stream (Degrees Celsius) | 11.33 | 8.175897             | 3.335357           | 39          |
| Velocity (Avg) (m/s)                                   | 0.42  | 0.50987              | 0.879644           | 40          |
| Width - Wetted (m)                                     | 20.6  | 5.6435               | 4.464378           | 40          |

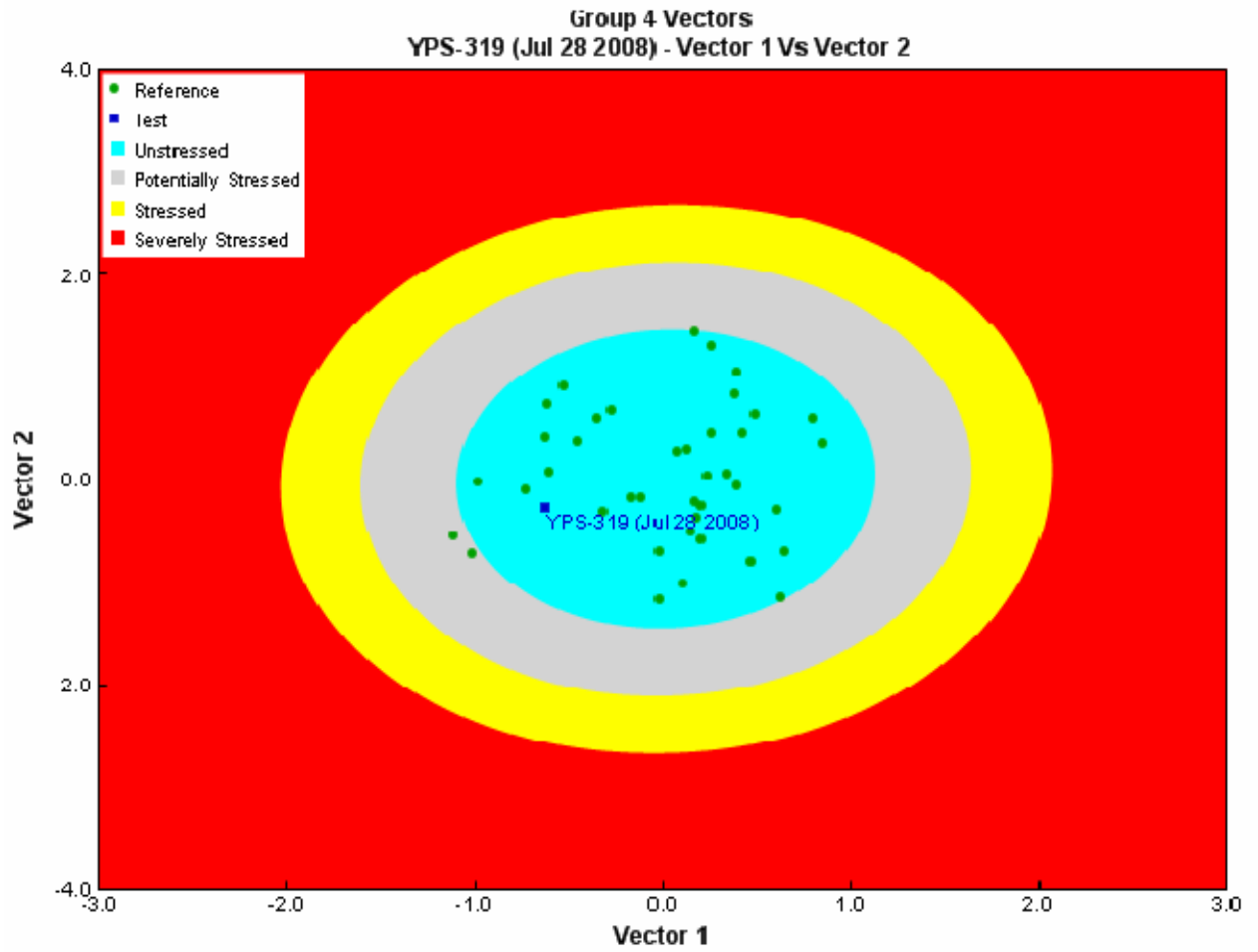
**Bray-Curtis Analysis**

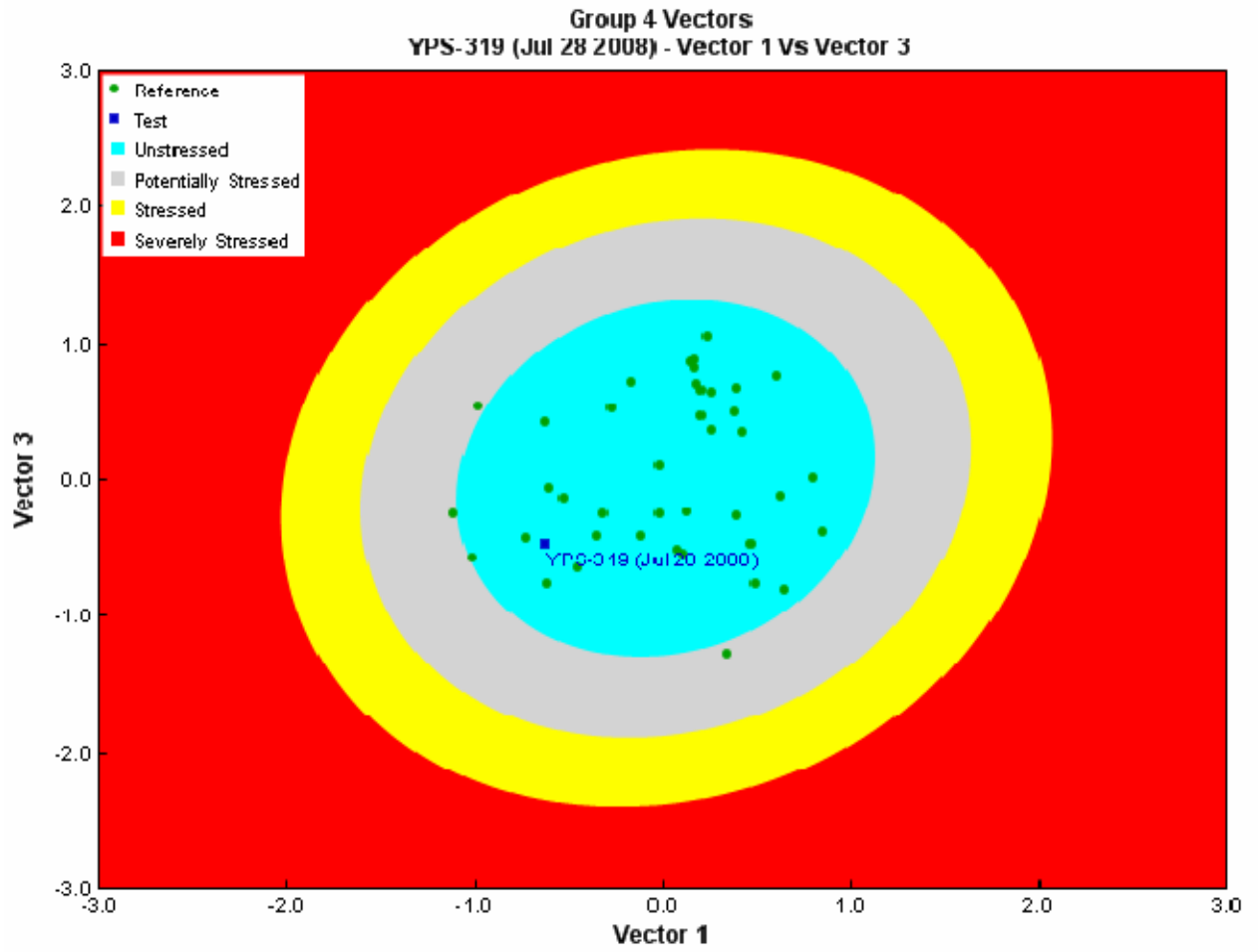
| Description                  | Value   |
|------------------------------|---------|
| Bray-Curtis Distance         | 0.5     |
| Bray Curtis Reference Median | 3038.12 |

**RIVPACS Analysis**

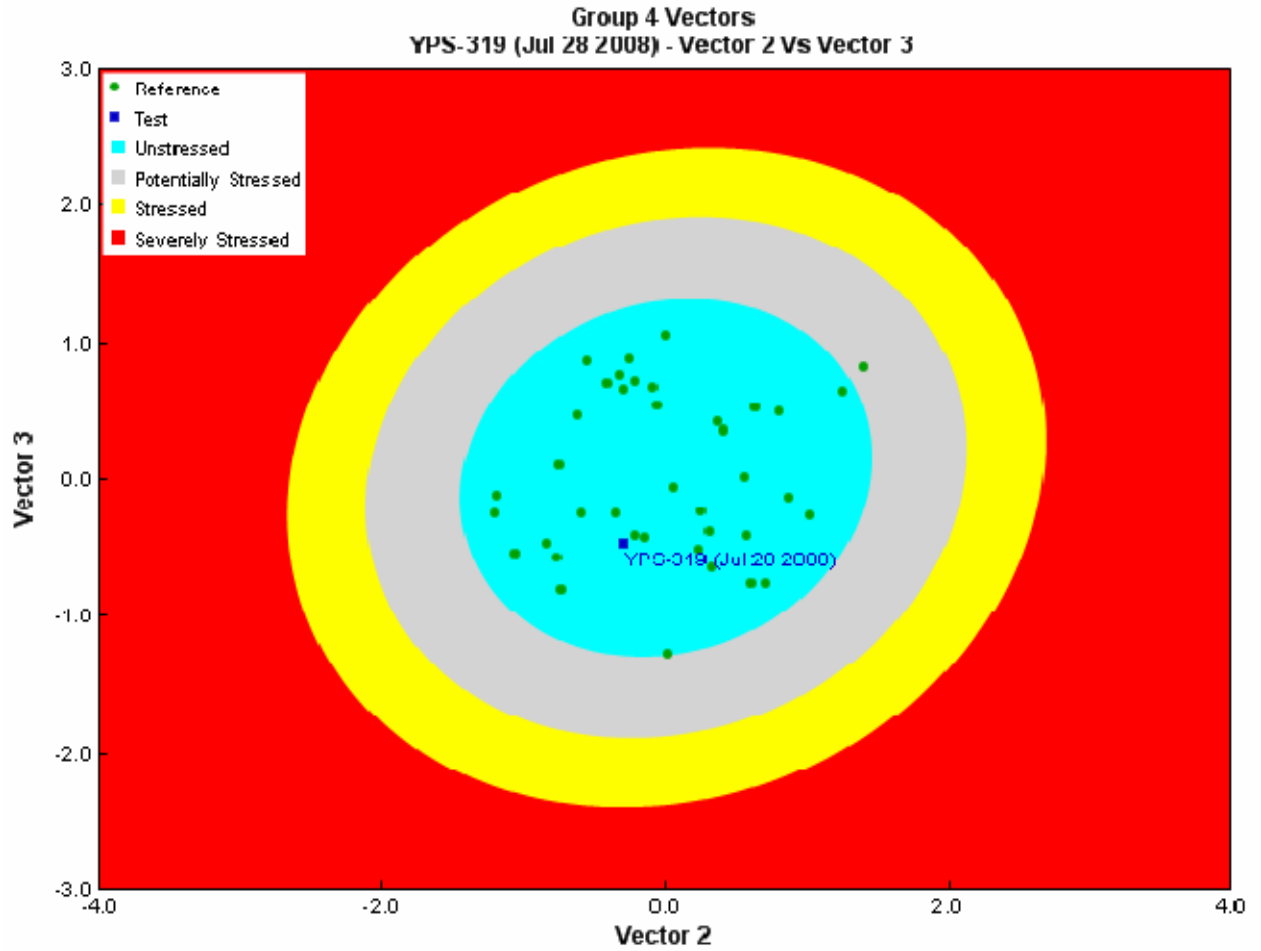
| Taxa            | Probability of Occurrence | 2008 Total Abundance | Mean of Abundance for Reference sites in Group 4 | SD of Abundance for Reference sites in Group 4 | Benthic Invertebrate Taxa Tolerance |             |
|-----------------|---------------------------|----------------------|--|--|-------------------------------------|-------------|
| Chironomidae    | 1                         | 450                  | 705.6  | 949.0  | 6                                   | Insensitive |
| Baetidae        | 0.78                      | 1217                 | 531.9  | 1178.0   | 4                                   | Insensitive |
| Simuliidae      | 0.78                      | 583                  | 197.5  | 362.0  | 6                                   | Insensitive |
| Nemouridae      | 0.69                      |                      | 158.4  | 274.1  | 2                                   | Sensitive   |
| Heptageniidae   | 0.58                      | 233                  | 92.7   | 122.0  | 4                                   | Insensitive |
| Empididae       | 0.48                      | 8                    | 7.9  | 21.3   | 6                                   | Insensitive |
| Tipulidae       | 0.48                      |                      | 9.1  | 24.9   | 3                                   | Insensitive |
| Limnephilidae   | 0.39                      | 8                    | 20.6   | 59.5   | 4                                   | Insensitive |
| Sperchonidae    | 0.39                      | 42                   | 17.8   | 58.3   | 8                                   | Tolerant    |
| Capniidae       | 0.35                      |                      | 43.7   | 155.1  | 1                                   | Sensitive   |
| Ameletidae      | 0.31                      |                      | 24.4   | 68.3   | 0                                   | Sensitive   |
| Chloroperlidae  | 0.3                       | 25                   | 36.8   | 102.2  | 1                                   | Sensitive   |
| Lumbriculidae   | 0.29                      |                      | 34.4   | 92.6   | 8                                   | Tolerant    |
| Lebertiidae     | 0.28                      | 42                   | 10.9   | 26.6   | 8                                   | Tolerant    |
| Perlodidae      | 0.27                      | 8                    | 11.6   | 44.0   | 2                                   | Sensitive   |
| Ephemerellidae  | 0.24                      | 367                  | 16.8   | 49.3   | 1                                   | Sensitive   |
| Psychodidae     | 0.23                      |                      | 4.8  | 15.2   | 10                                  | Tolerant    |
| Naididae        | 0.22                      | 17                   | 7.6  | 24.3   | 10                                  | Tolerant    |
| Rhyacophilidae  | 0.2                       | 8                    | 4.5  | 17.7   | 0                                   | Sensitive   |
| Ceratopogonidae | 0.16                      | 42                   | 1.7  | 6.8  | 6                                   | Insensitive |
| Dytiscidae      | 0.12                      |                      | 1.0  | 3.0  | 5                                   | Insensitive |
| Glossosomatidae | 0.12                      | 8                    | 2.5  | 7.8  | 0                                   | Sensitive   |
| Brachycentridae | 0.09                      |                      | 15.3   | 94.8   | 1                                   | Sensitive   |
| Sphaeriidae     | 0.09                      |                      | 9.4  | 40.6   | 8                                   | Tolerant    |
| Leptophlebiidae | 0.07                      | 8                    | 12.6   | 54.1   | 2                                   | Sensitive   |
| Leuctridae      | 0.07                      |                      | 0.9  | 5.8  | 0                                   | Sensitive   |
| Lymnaeidae      | 0.07                      |                      | 2.1  | 10.7   | 6                                   | Insensitive |
| Muscidae        | 0.07                      |                      | 0.3  | 1.0  | 6                                   | Insensitive |
| Physidae        | 0.06                      |                      | 4.3  | 19.7   | 8                                   | Tolerant    |
| Valvatidae      | 0.06                      |                      | 0.0  | 0.0  | 8                                   | Tolerant    |
| Dixidae         | 0.05                      |                      | 1.2  | 6.7  | 1                                   | Sensitive   |
| Hydroptilidae   | 0.05                      | 8                    | 0.9  | 4.8  | 4                                   | Insensitive |
| Apataniidae     | 0.04                      | 8                    | 21.6   | 126.4  | 1                                   | Sensitive   |

**Site Assessment Graphs**









**Site Assessment Vector Data**

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

**Site Metrics**

| Metric Name       | Test Site | Reference Group Mean | Standard Deviation | Sample Size |
|-------------------|-----------|----------------------|--------------------|-------------|
| Total Abundance   | 3083.24   | 2053.1               |                    |             |
| Total No. of Taxa | 18.0      | 10.4                 | 3.5                | 40          |

## Site Assessment Report

### Site Metadata

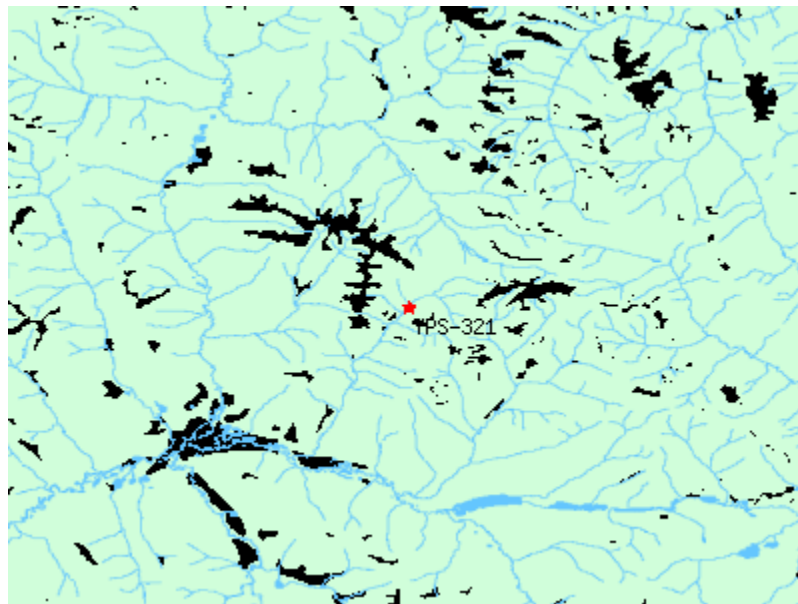
|              |                   |
|--------------|-------------------|
| Site         | YPS-321           |
| Sample Date  | Jul 28 2008       |
| Latitude     | N 62° 5' 14.58"   |
| Longitude    | W 137° 13' 40.32" |
| Altitude     |                   |
| Feature Name | Nansen Creek      |
| Stream Order | 2                 |

### Site Photograph

*Up Stream*



### Context Map



### BEAST Prediction Results

|                        |  |       |      |       |
|------------------------|--|-------|------|-------|
| Predictor Variables    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |       |      |       |
| Predicted Group Number | 4  |       |      |       |
| Group                  | 1  | 2     | 3    | 4     |
| Probability            | 3.4%   | 18.1% | 8.3% | 70.1% |

**Habitat Attributes**

| Variable   | Site  | Reference Group Mean | Standard Deviation | Sample Size |
|--|-------|----------------------|--------------------|-------------|
| Canopy - % coverage (PercentRange)                     | 1     | 1.516129032          | 1.179575284        | 31          |
| Channel Depth - avg (cm)                               | 23    | 26.74793103          | 19.12511314        | 29          |
| General - pH (pH)                                      | 6.7   | 7.81025              | 0.6294747          | 40          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 158   | 251.61875            | 183.3222272        | 32          |
| General - Turbidity (NTU)                              | 27    | 1.467333333          | 3.130126576        | 15          |
| Landcover – Alpine (%)                                 | 26.2  | 0.311483903          | 0.321628064        | 40          |
| Landcover – Lake (%)                                   | 0     | 0.006318333          | 0.022384995        | 40          |
| Nitrogen - nitrate + nitrite (mg/L)                    | 0.04  | 0.0019               |                    | 1           |
| Precip Rainfall JUN (mm) (mm)                          | 45    | 42.56                | 8.34459137         | 40          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 121.3 | 123.515              | 13.76933699        | 40          |
| Solids - total suspended (TSS) (mg/L)                  | 6.875 | 5.9704               | 6.025368924        | 25          |
| Substrate - embeddedness category (Category(1-5))      | 3     | 3.870967742          | 0.884757424        | 31          |
| Temperature - lake surface or stream (Degrees Celsius) | 5.62  | 8.175897436          | 3.335356619        | 39          |
| Velocity (Avg) (m/s)                                   | 0.68  | 0.50987              | 0.879643596        | 40          |
| Width - Wetted (m)                                     | 2.8   | 5.6435               | 4.464378413        | 40          |

**Bray-Curtis Analysis**

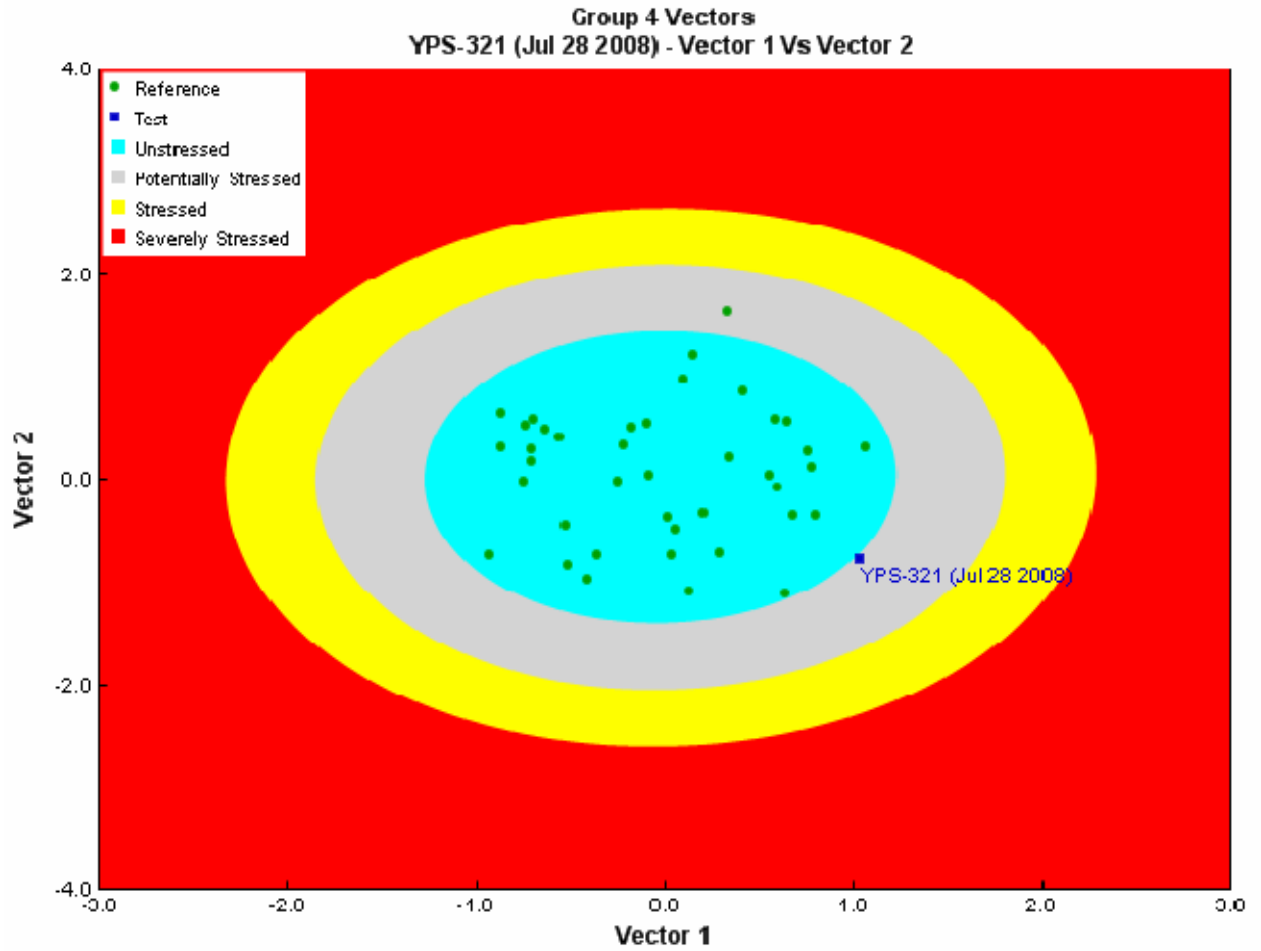
| Description                  | Value   |
|------------------------------|---------|
| Bray-Curtis Distance         | 0.57    |
| Bray Curtis Reference Median | 3038.12 |

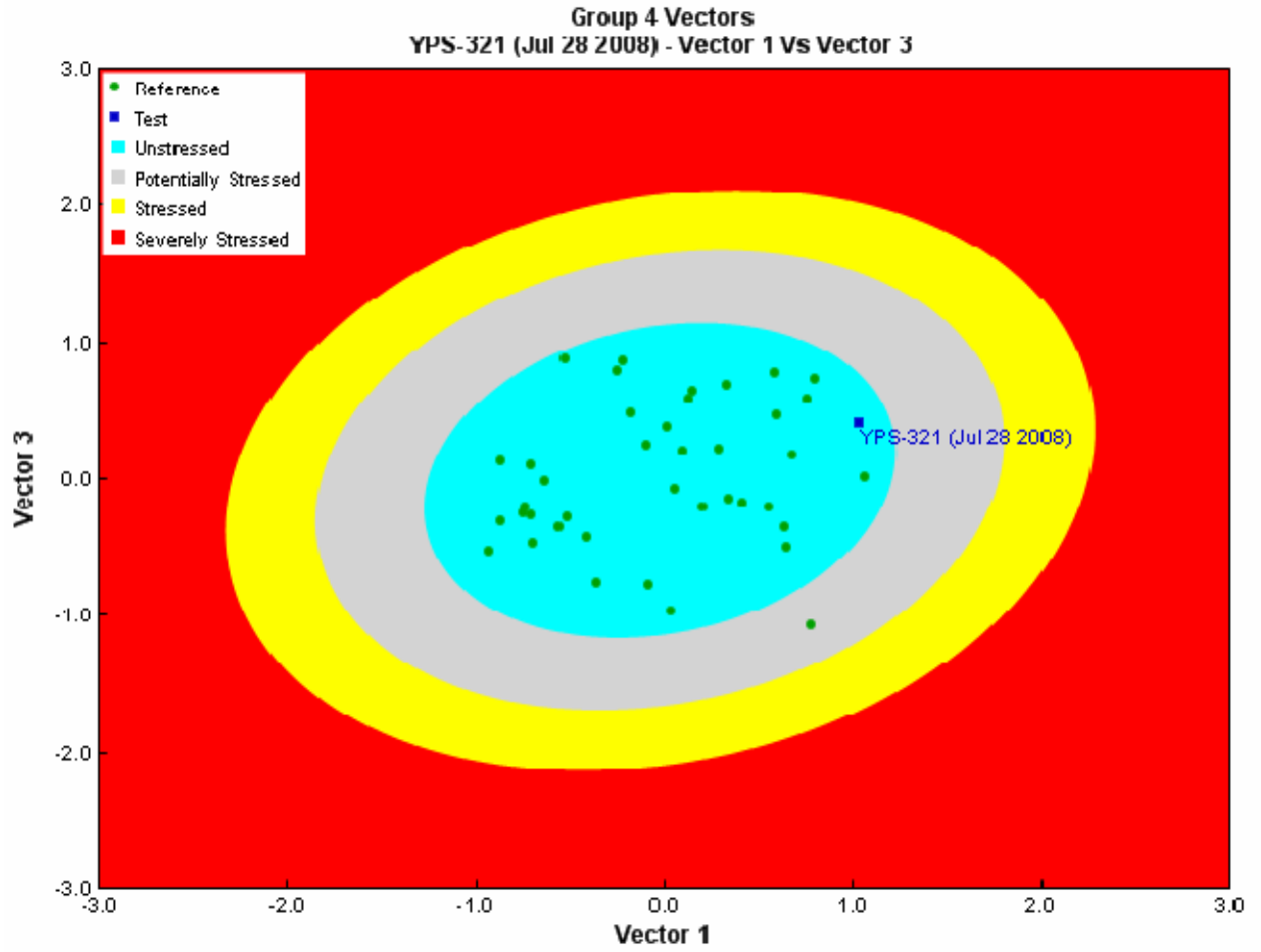
**RIVPACS Analysis**

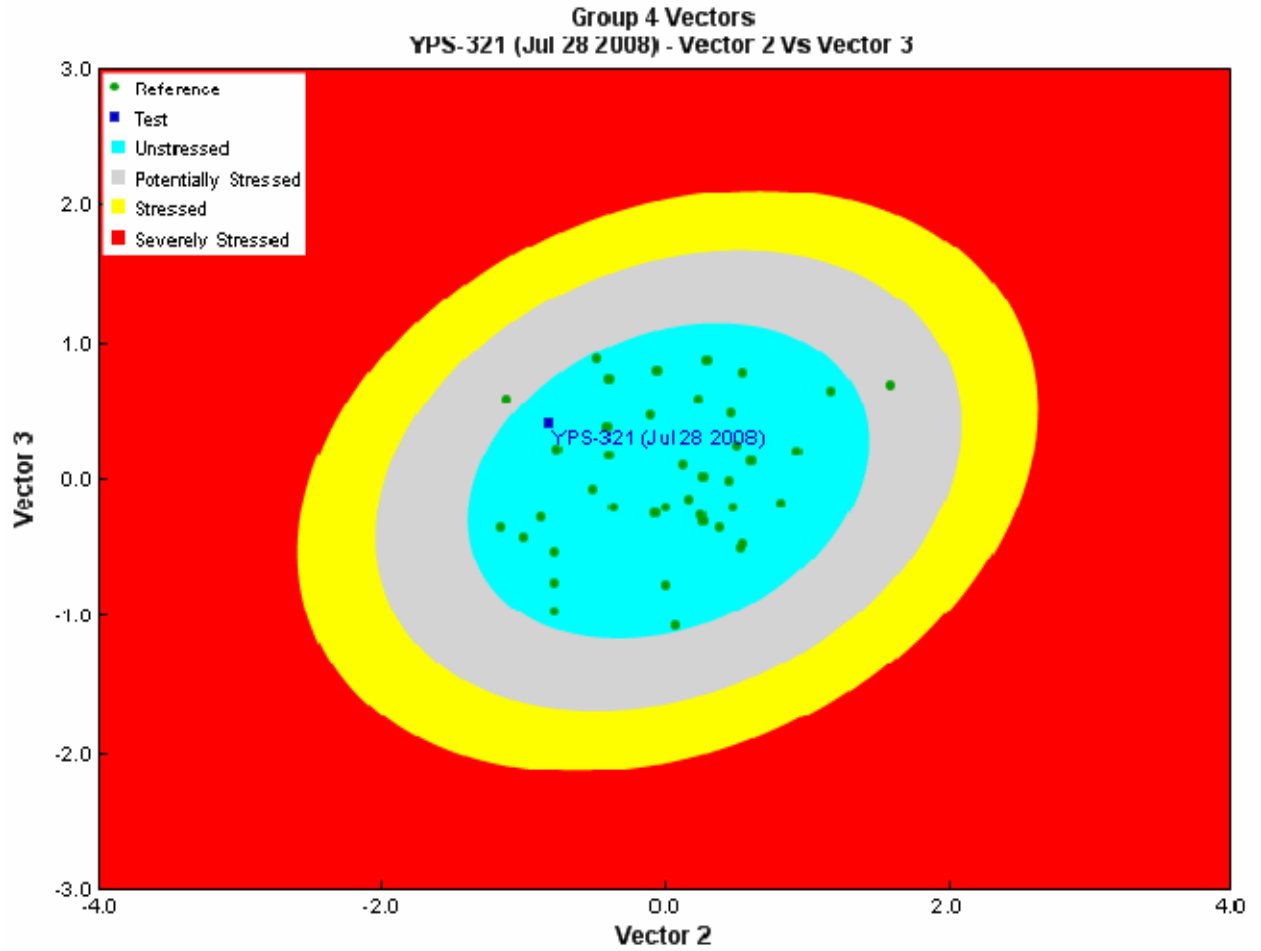
| Taxa           | Probability of Occurrence | 2008 Total Abundance | Mean of Abundance for Reference sites in Group 4 | SD of Abundance for Reference sites in Group 4 | Benthic Invertebrate Taxa Tolerance |             |
|----------------|---------------------------|----------------------|--|--|-------------------------------------|-------------|
| Chironomidae   | 1                         | 50                   | 705.6  | 949.0  | 6                                   | Insensitive |
| Baetidae       | 0.82                      | 2800                 | 531.9  | 1178.0   | 4                                   | Insensitive |
| Simuliidae     | 0.82                      | 413                  | 197.5  | 362.0  | 6                                   | Insensitive |
| Nemouridae     | 0.72                      | 275                  | 158.4  | 274.1  | 2                                   | Sensitive   |
| Heptageniidae  | 0.62                      | 413                  | 92.7   | 122.0  | 4                                   | Insensitive |
| Empididae      | 0.52                      | 50                   | 7.9  | 21.3   | 6                                   | Insensitive |
| Tipulidae      | 0.5                       | 13                   | 9.1  | 24.9   | 3                                   | Insensitive |
| Limnephilidae  | 0.4                       | 13                   | 20.6   | 59.5   | 4                                   | Insensitive |
| Sperchonidae   | 0.39                      | -                    | 17.8   | 58.3   | 8                                   | Tolerant    |
| Capniidae      | 0.38                      | -                    | 43.7   | 155.1  | 1                                   | Sensitive   |
| Ameletidae     | 0.34                      | -                    | 24.4   | 68.3   | 0                                   | Sensitive   |
| Chloroperlidae | 0.3                       | -                    | 36.8   | 102.2  | 1                                   | Sensitive   |
| Lebertiidae    | 0.3                       | -                    | 10.9   | 26.6   | 8                                   | Tolerant    |
| Perlodidae     | 0.29                      | -                    | 11.6   | 44.0   | 2                                   | Sensitive   |
| Lumbriculidae  | 0.28                      | 38                   | 34.4   | 92.6   | 8                                   | Tolerant    |

|                 |      |    |      |      |    |             |
|-----------------|------|----|------|------|----|-------------|
| EphemereIIDae   | 0.24 | -  | 16.8 | 49.3 | 1  | Sensitive   |
| Psychodidae     | 0.23 | -  | 4.8  | 15.2 | 10 | Tolerant    |
| Naididae        | 0.21 | -  | 7.6  | 24.3 | 10 | Tolerant    |
| Rhyacophilidae  | 0.19 | -  | 4.5  | 17.7 | 0  | Sensitive   |
| Ceratopogonidae | 0.14 | 25 | 1.7  | 6.8  | 6  | Insensitive |
| Glossosomatidae | 0.13 | -  | 2.5  | 7.8  | 0  | Sensitive   |
| Dytiscidae      | 0.11 | -  | 1.0  | 3.0  | 5  | Insensitive |
| Brachycentridae | 0.09 | 13 | 15.3 | 94.8 | 1  | Sensitive   |

**Site Assessment Graphs**







**Site Assessment Vector Data**

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

**Site Metrics**

| Metric Name       | Test Site | Reference Group Mean | Standard Deviation | Sample Size |
|-------------------|-----------|----------------------|--------------------|-------------|
| Total Abundance   | 4100.0    | 2053.1               |                    |             |
| Total No. of Taxa | 11.0      | 10.4                 | 3.5                | 40          |

## Site Assessment Report

### Site Metadata

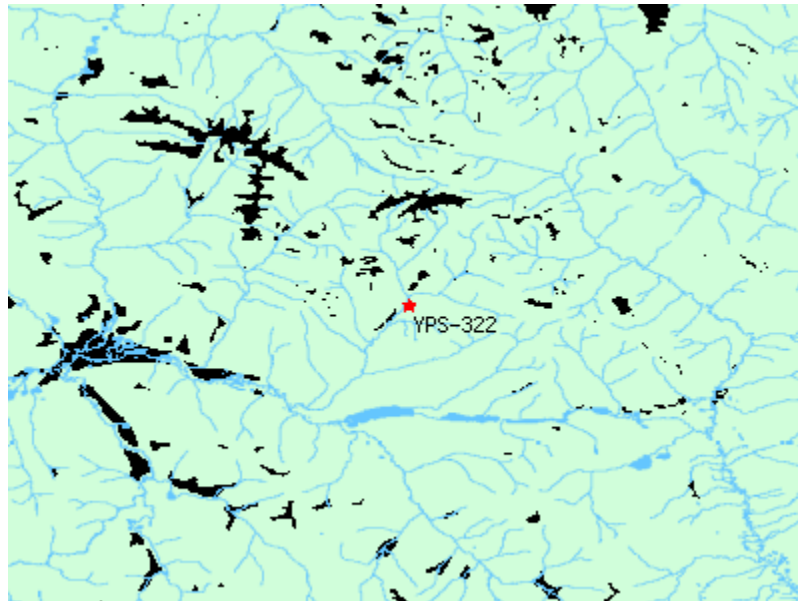
|                     |                |
|---------------------|----------------|
| <b>Site</b>         | YPS-322        |
| <b>Sample Date</b>  | Jul 28 2008    |
| <b>Latitude</b>     | N 62° 4' 34"   |
| <b>Longitude</b>    | W 137° 4' 28"  |
| <b>Altitude</b>     |                |
| <b>Feature Name</b> | Victoria Creek |
| <b>Stream Order</b> | 3              |

### Site Photograph

*Up Stream*



### Context Map



### BEAST Prediction Results

|                               |  |          |          |          |
|-------------------------------|--|----------|----------|----------|
| <b>Predictor Variables</b>    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |          |          |          |
| <b>Predicted Group Number</b> | 4  |          |          |          |
| <b>Group</b>                  | <b>1</b>   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>Probability</b>            | 2.8%   | 13.4%    | 6.3%     | 77.5%    |

**Habitat Attributes**

| Variable   | Site  | Reference Group Mean | Standard Deviation | Sample Size |
|--|-------|----------------------|--------------------|-------------|
| Canopy - % coverage (PercentRange)                     | 2     | 1.516129032          | 1.179575           | 31          |
| Channel Depth - avg (cm)                               | 15.2  | 26.74793103          | 19.12511           | 29          |
| General - pH (pH)                                      | 6.7   | 7.81025              | 0.629475           | 40          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 140   | 251.61875            | 183.3222           | 32          |
| General - Turbidity (NTU)                              | 8     | 1.467333333          | 3.130127           | 15          |
| Landcover – Alpine (%)                                 | 31.1  | 0.311483903          | 0.321628           | 40          |
| Landcover – Lake (%)                                   | 0     | 0.006318333          | 0.022385           | 40          |
| Nitrogen - nitrate + nitrite (mg/L)                    | 0.12  | 0.0019               |                    | 1           |
| Precip Rainfall JUN (mm) (mm)                          | 45    | 42.56                | 8.344591           | 40          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 121.3 | 123.515              | 13.76934           | 40          |
| Solids - total suspended (TSS) (mg/L)                  | 0.375 | 5.9704               | 6.025369           | 25          |
| Substrate - embeddedness category (Category(1-5))      | 3     | 3.870967742          | 0.884757           | 31          |
| Temperature - lake surface or stream (Degrees Celsius) | 5.43  | 8.175897436          | 3.335357           | 39          |
| Width - Wetted (m)                                     | 5.1   | 5.6435               | 4.464378           | 40          |

**Bray-Curtis Analysis**

| Description                  | Value   |
|------------------------------|---------|
| Bray-Curtis Distance         | 0.88    |
| Bray Curtis Reference Median | 3038.12 |

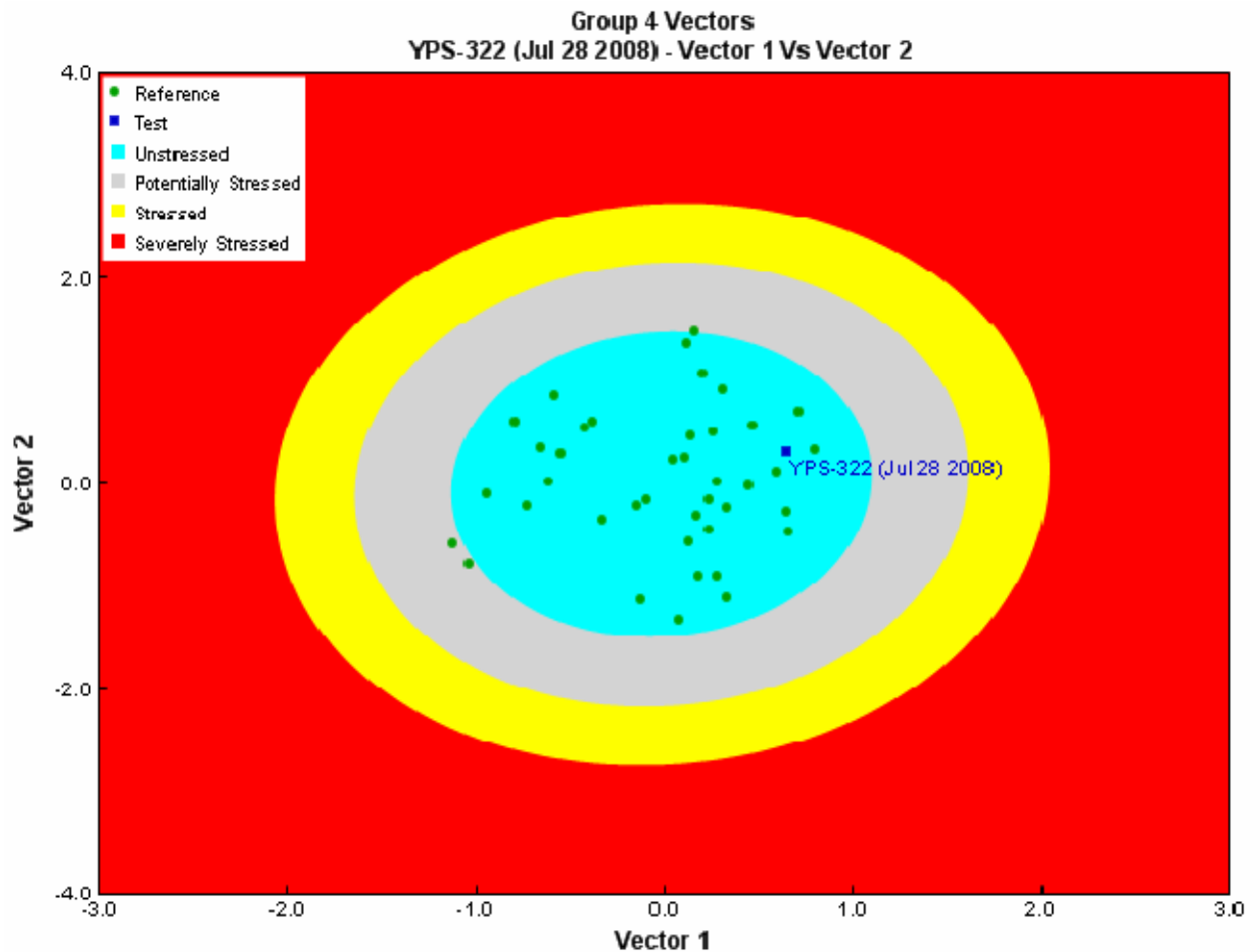
**RIVPACS Analysis**

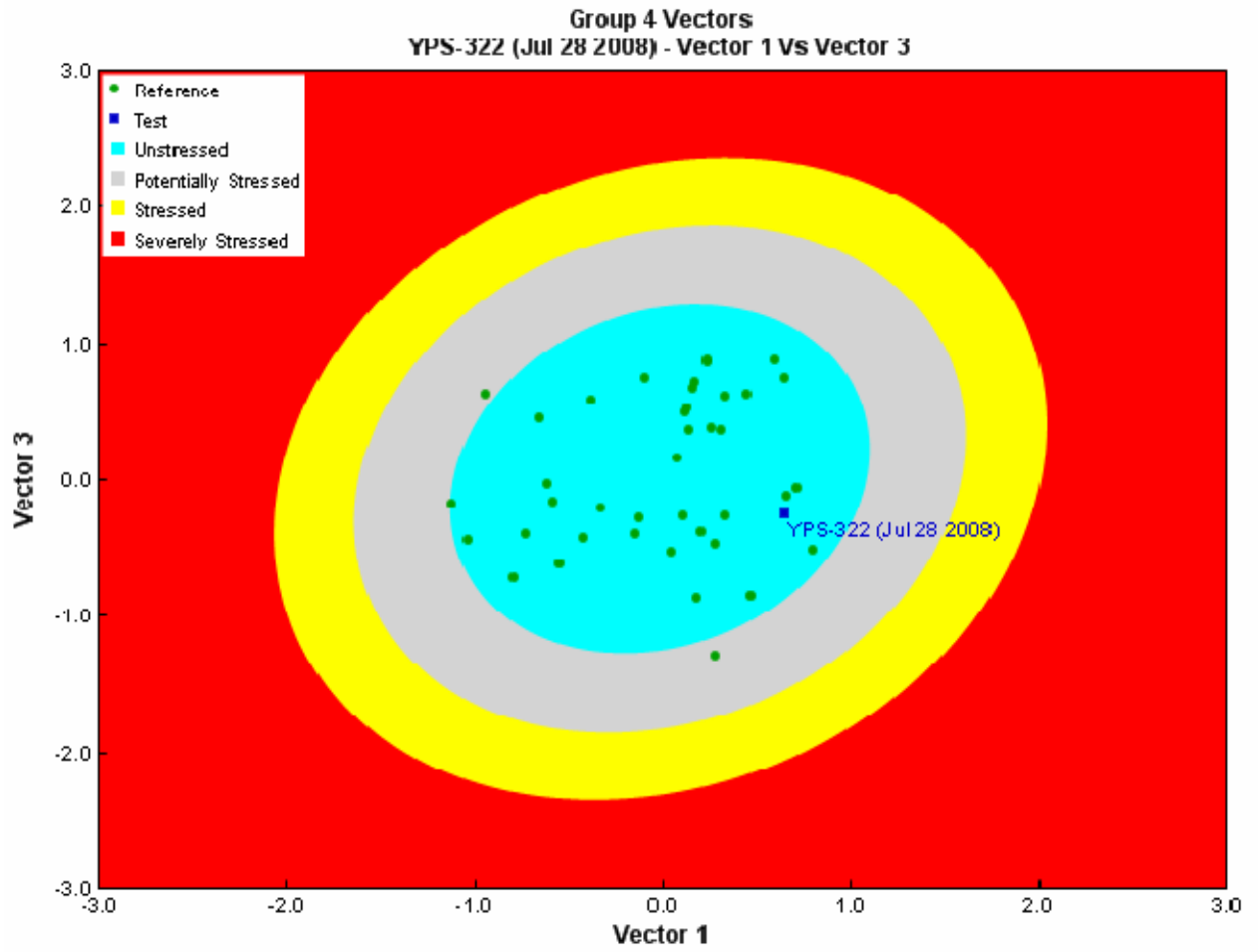
| Taxa           | Probability of Occurrence | 2008 Total Abundance | Mean of Abundance for Reference sites in Group 4 | SD of Abundance for Reference sites in Group 4 | Benthic Invertebrate Taxa Tolerance |             |
|----------------|---------------------------|----------------------|--|--|-------------------------------------|-------------|
| Chironomidae   | 1                         | 207                  | 705.6  | 949.0  | 6                                   | Insensitive |
| Baetidae       | 0.84                      | 258                  | 531.9  | 1178.0   | 4                                   | Insensitive |
| Simuliidae     | 0.84                      | 24                   | 197.5  | 362.0  | 6                                   | Insensitive |
| Nemouridae     | 0.73                      | 33                   | 158.4  | 274.1  | 2                                   | Sensitive   |
| Heptageniidae  | 0.64                      | 33                   | 92.7   | 122.0  | 4                                   | Insensitive |
| Empididae      | 0.54                      | 33                   | 7.9  | 21.3   | 6                                   | Insensitive |
| Tipulidae      | 0.5                       | -                    | 9.1  | 24.9   | 3                                   | Insensitive |
| Capniidae      | 0.41                      | 9                    | 43.7   | 155.1  | 1                                   | Sensitive   |
| Limnephilidae  | 0.4                       | -                    | 20.6   | 59.5   | 4                                   | Insensitive |
| Sperchonidae   | 0.38                      | -                    | 17.8   | 58.3   | 8                                   | Tolerant    |
| Ameletidae     | 0.34                      | 4                    | 24.4   | 68.3   | 0                                   | Sensitive   |
| Lebertiidae    | 0.31                      | -                    | 10.9   | 26.6   | 8                                   | Tolerant    |
| Chloroperlidae | 0.3                       | 2                    | 36.8   | 102.2  | 1                                   | Sensitive   |
| Perlodidae     | 0.3                       | 7                    | 11.6   | 44.0   | 2                                   | Sensitive   |
| Lumbriculidae  | 0.28                      | 98                   | 34.4   | 92.6   | 8                                   | Tolerant    |

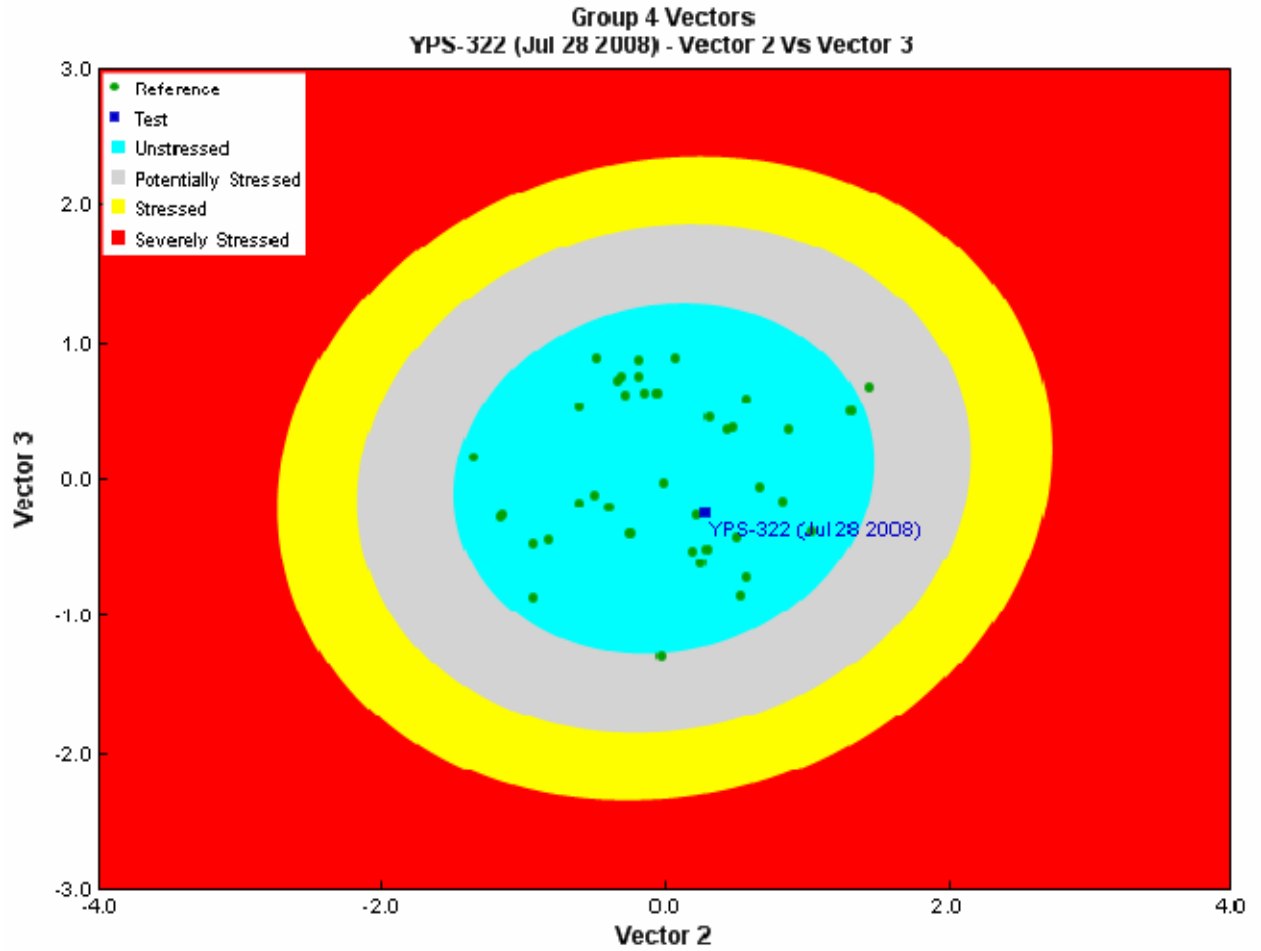


|                 |      |   |      |       |    |             |
|-----------------|------|---|------|-------|----|-------------|
| Ephemereilidae  | 0.24 | - | 16.8 | 49.3  | 1  | Sensitive   |
| Psychodidae     | 0.24 | - | 4.8  | 15.2  | 10 | Tolerant    |
| Naididae        | 0.19 | - | 7.6  | 24.3  | 10 | Tolerant    |
| Rhyacophilidae  | 0.19 | - | 4.5  | 17.7  | 0  | Sensitive   |
| Ceratopogonidae | 0.13 | 2 | 1.7  | 6.8   | 6  | Insensitive |
| Glossosomatidae | 0.13 | - | 2.5  | 7.8   | 0  | Sensitive   |
| Dytiscidae      | 0.11 | - | 1.0  | 3.0   | 5  | Insensitive |
| Sphaeriidae     | 0.1  | - | 9.4  | 40.6  | 8  | Tolerant    |
| Brachycentridae | 0.09 | - | 15.3 | 94.8  | 1  | Sensitive   |
| Muscidae        | 0.08 | - | 0.3  | 1.0   | 6  | Insensitive |
| Leptophlebiidae | 0.07 | - | 12.6 | 54.1  | 2  | Sensitive   |
| Lymnaeidae      | 0.07 | - | 2.1  | 10.7  | 6  | Insensitive |
| Apataniidae     | 0.06 | - | 21.6 | 126.4 | 1  | Sensitive   |
| Hydrozetidae    | 0.06 | 2 | 0.8  | 4.0   |    |             |

**Site Assessment Graphs**







**Site Assessment Vector Data**

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

**Site Metrics**

| Metric Name       | Test Site | Reference Group Mean | Standard Deviation | Sample Size |
|-------------------|-----------|----------------------|--------------------|-------------|
| Total Abundance   | 713.26    | 2053.1               |                    |             |
| Total No. of Taxa | 13.0      | 10.4                 | 3.5                | 40          |

## Site Assessment Report

### Site Metadata

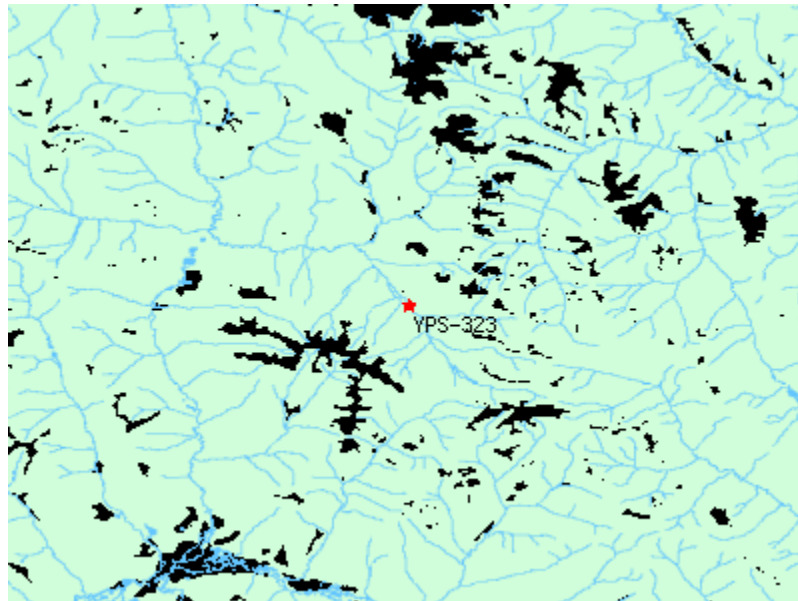
|              |                |
|--------------|----------------|
| Site         | YPS-323        |
| Sample Date  | Jul 28 2008    |
| Latitude     | N 62° 9' 2"    |
| Longitude    | W 137° 19' 15" |
| Altitude     | 3710           |
| Feature Name | Klaza River    |
| Stream Order | 3              |

### Site Photograph

*Up Stream*



### Context Map



### BEAST Prediction Results

|                        |  |       |       |       |
|------------------------|--|-------|-------|-------|
| Predictor Variables    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |       |       |       |
| Predicted Group Number | 4  |       |       |       |
| Group                  | 1  | 2     | 3     | 4     |
| Probability            | 4.7%   | 11.4% | 11.8% | 72.1% |

**Habitat Attributes**

| Variable   | Site  | Reference Group Mean | Standard Deviation | Sample Size |
|--|-------|----------------------|--------------------|-------------|
| Canopy - % coverage (PercentRange)                     | 2     | 1.516129032          | 1.179575           | 31          |
| Channel Depth - avg (cm)                               | 17.8  | 26.74793103          | 19.12511           | 29          |
| General - pH (pH)                                      | 6.8   | 7.81025              | 0.629475           | 40          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 96    | 251.61875            | 183.3222           | 32          |
| General - Turbidity (NTU)                              | 2     | 1.467333333          | 3.130127           | 15          |
| Landcover – Alpine (%)                                 | 61.6  | 0.311483903          | 0.321628           | 40          |
| Landcover – Lake (%)                                   | 0     | 0.006318333          | 0.022385           | 40          |
| Nitrogen - nitrate + nitrite (mg/L)                    | 0.05  | 0.0019               |                    | 1           |
| Precip Rainfall JUN (mm) (mm)                          | 45    | 42.56                | 8.344591           | 40          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 121.3 | 123.515              | 13.76934           | 40          |
| Solids - total suspended (TSS) (mg/L)                  | 2     | 5.9704               | 6.025369           | 25          |
| Substrate - embeddedness category (Category(1-5))      | 4     | 3.870967742          | 0.884757           | 31          |
| Temperature - lake surface or stream (Degrees Celsius) | 5.79  | 8.175897436          | 3.335357           | 39          |
| Width - Wetted (m)                                     | 5.6   | 5.6435               | 4.464378           | 40          |

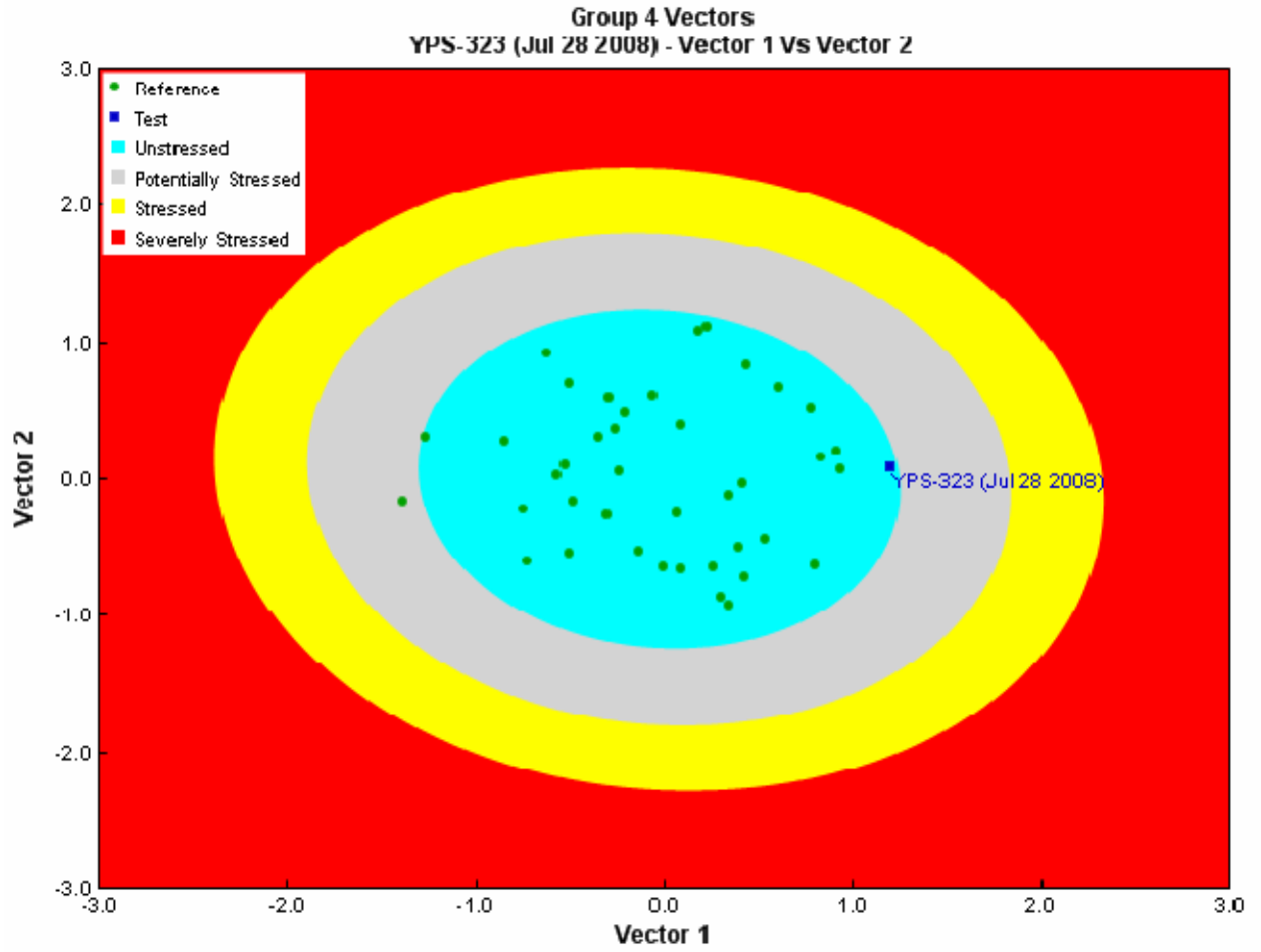
**Bray-Curtis Analysis**

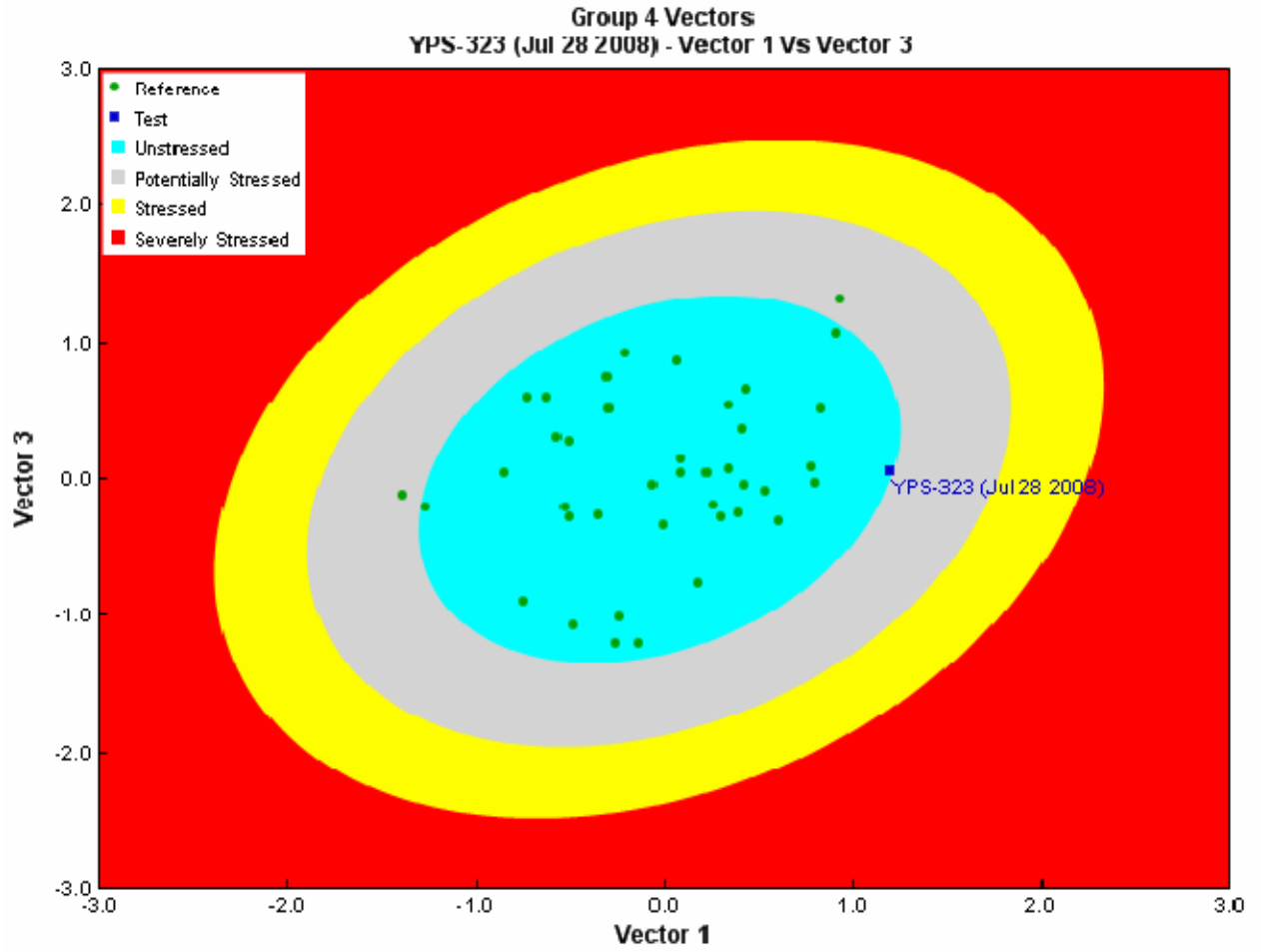
| Description                  | Value   |
|------------------------------|---------|
| Bray-Curtis Distance         | 0.9     |
| Bray Curtis Reference Median | 3038.12 |

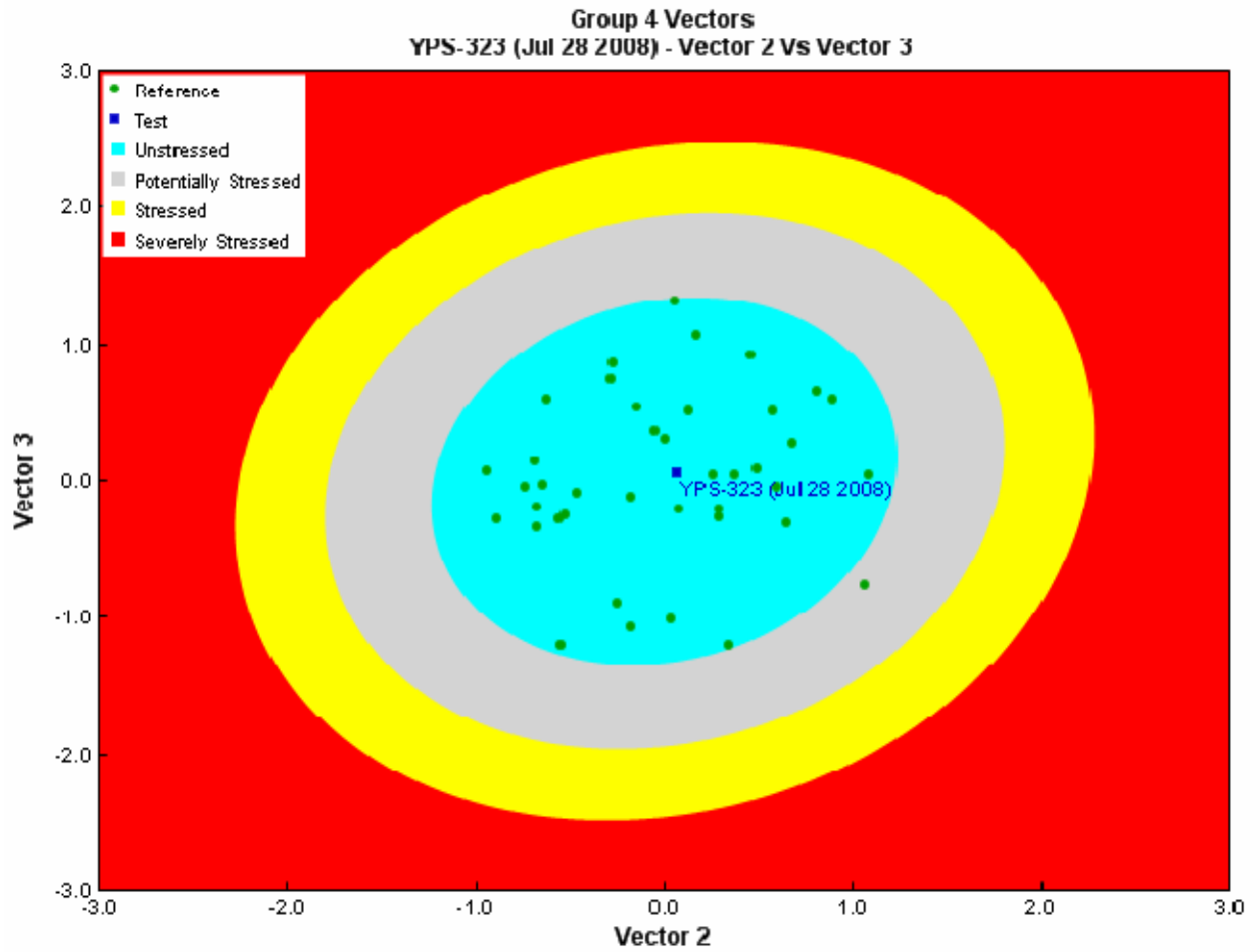
**RIVPACS Analysis**

| Taxa           | Probability of Occurrence | 2008 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                         | 159                  | 705.6  | 949.0  | 6                                   | Insensitive |
| Simuliidae     | 0.81                      | 23                   | 197.5  | 362.0  | 6                                   | Insensitive |
| Baetidae       | 0.8                       | 44                   | 531.9  | 1178.0   | 4                                   | Insensitive |
| Nemouridae     | 0.71                      | 3                    | 158.4  | 274.1  | 2                                   | Sensitive   |
| Heptageniidae  | 0.62                      | 12                   | 92.7   | 122.0  | 4                                   | Insensitive |
| Empididae      | 0.51                      | 1                    | 7.9  | 21.3   | 6                                   | Insensitive |
| Tipulidae      | 0.49                      | -                    | 9.1  | 24.9   | 3                                   | Insensitive |
| Capniidae      | 0.39                      | -                    | 43.7   | 155.1  | 1                                   | Sensitive   |
| Limnephilidae  | 0.38                      | 3                    | 20.6   | 59.5   | 4                                   | Insensitive |
| Sperchonidae   | 0.37                      | -                    | 17.8   | 58.3   | 8                                   | Tolerant    |
| Ameletidae     | 0.33                      | -                    | 24.4   | 68.3   | 0                                   | Sensitive   |
| Chloroperlidae | 0.3                       | 7                    | 36.8   | 102.2  | 1                                   | Sensitive   |
| Lebertiidae    | 0.29                      | 3                    | 10.9   | 26.6   | 8                                   | Tolerant    |
| Lumbriculidae  | 0.28                      | -                    | 34.4   | 92.6   | 8                                   | Tolerant    |
| Perlodidae     | 0.28                      | 8                    | 11.6   | 44.0   | 2                                   | Sensitive   |
| Ephemerellidae | 0.24                      | -                    | 16.8   | 49.3   | 1                                   | Sensitive   |
| Psychodidae    | 0.23                      | -                    | 4.8  | 15.2   | 10                                  | Tolerant    |
| Naididae       | 0.2                       | -                    | 7.6  | 24.3   | 10                                  | Tolerant    |

**Site Assessment Graphs**







**Site Assessment Vector Data**

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

**Site Metrics**

| Metric Name       | Test Site | Reference Group Mean | Standard Deviation | Sample Size |
|-------------------|-----------|----------------------|--------------------|-------------|
| Total Abundance   | 263.0     | 2053.1               |                    |             |
| Total No. of Taxa | 10.0      | 10.4                 | 3.5                | 40          |



# Site Assessment Report

## Site Metadata

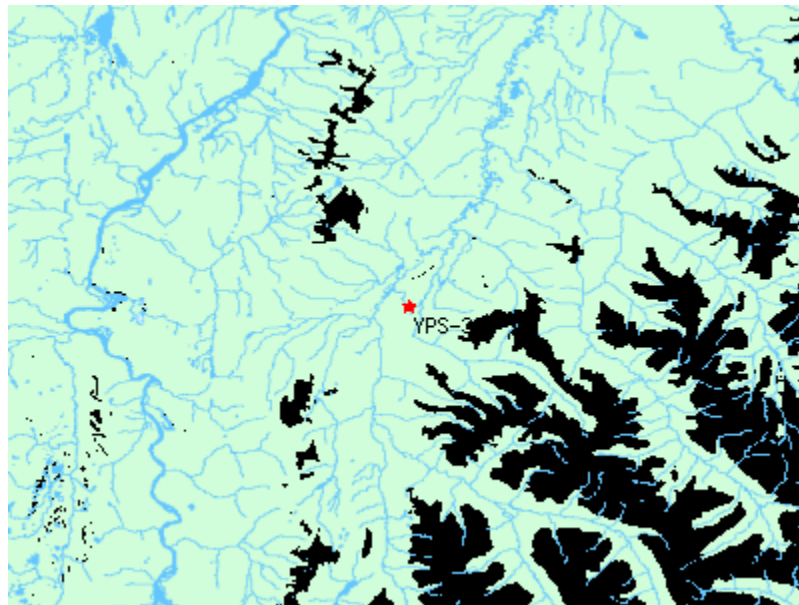
|              |                   |
|--------------|-------------------|
| Site         | YPS-325           |
| Sample Date  | Jul 30 2008       |
| Latitude     | N 61° 20' 29.2"   |
| Longitude    | W 134° 21' 43"    |
| Altitude     | 2706              |
| Feature Name | Livingstone Creek |
| Stream Order | 3                 |

## Site Photograph

*Aerial*



**Context Map**



**BEAST Prediction Results**

|                               |  |          |          |          |
|-------------------------------|--|----------|----------|----------|
| <b>Predictor Variables</b>    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |          |          |          |
| <b>Predicted Group Number</b> | 4  |          |          |          |
| <b>Group</b>                  | <b>1</b>   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>Probability</b>            | 1.6%   | 3.3%     | 3.1%     | 92.0%    |

**Habitat Attributes**

| Variable   | Site  | Reference Group Mean | Standard Deviation | Sample Size |
|--|-------|----------------------|--------------------|-------------|
| Canopy - % coverage (PercentRange)                     | 2     | 1.516129             | 1.179575           | 31          |
| Channel Depth - max (cm)                               | 45    | 26.74793             | 19.12511           | 29          |
| General - pH (pH)                                      | 7.3   | 7.81025              | 0.629475           | 40          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 139.2 | 251.6188             | 183.3222           | 32          |
| <b>General - Turbidity (NTU)</b>                       |       | <b>1.467333</b>      | <b>3.130127</b>    | <b>15</b>   |
| Landcover – Alpine (%)                                 | 48.7  | 0.311484             | 0.321628           | 40          |
| Landcover – Lake (%)                                   | 0     | 0.006318             | 0.022385           | 40          |
| <b>Nitrogen - nitrate + nitrite (mg/L)</b>             | 0.01  | <b>0.0019</b>        |                    | <b>1</b>    |
| Precip Rainfall JUN (mm) (mm)                          | 33.7  | 42.56                | 8.344591           | 40          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 114.8 | 123.515              | 13.76934           | 40          |
| Solids - total suspended (TSS)                         |       | 5.9704               | 6.025369           | 25          |
| Substrate - embeddedness category (Category(1-5))      | 4     | 3.870968             | 0.884757           | 31          |
| Temperature - lake surface or stream (Degrees Celsius) | 6.8   | 8.175897             | 3.335357           | 39          |
| Velocity (Avg) (m/s)                                   | 57.8  | 0.50987              | 0.879644           | 40          |
| Width - Wetted (m)                                     | 17    | 5.6435               | 4.464378           | 40          |

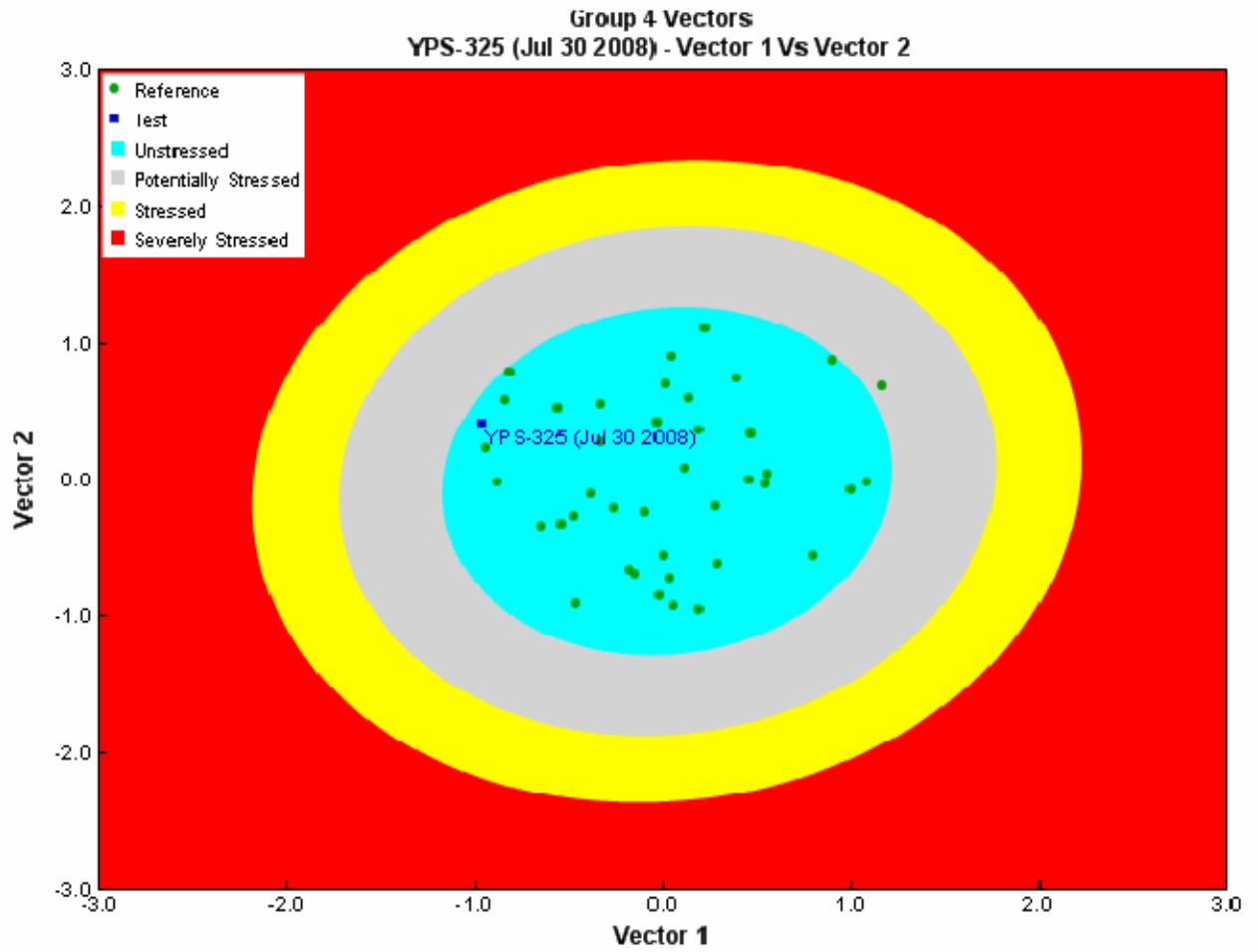
**Bray-Curtis Analysis**

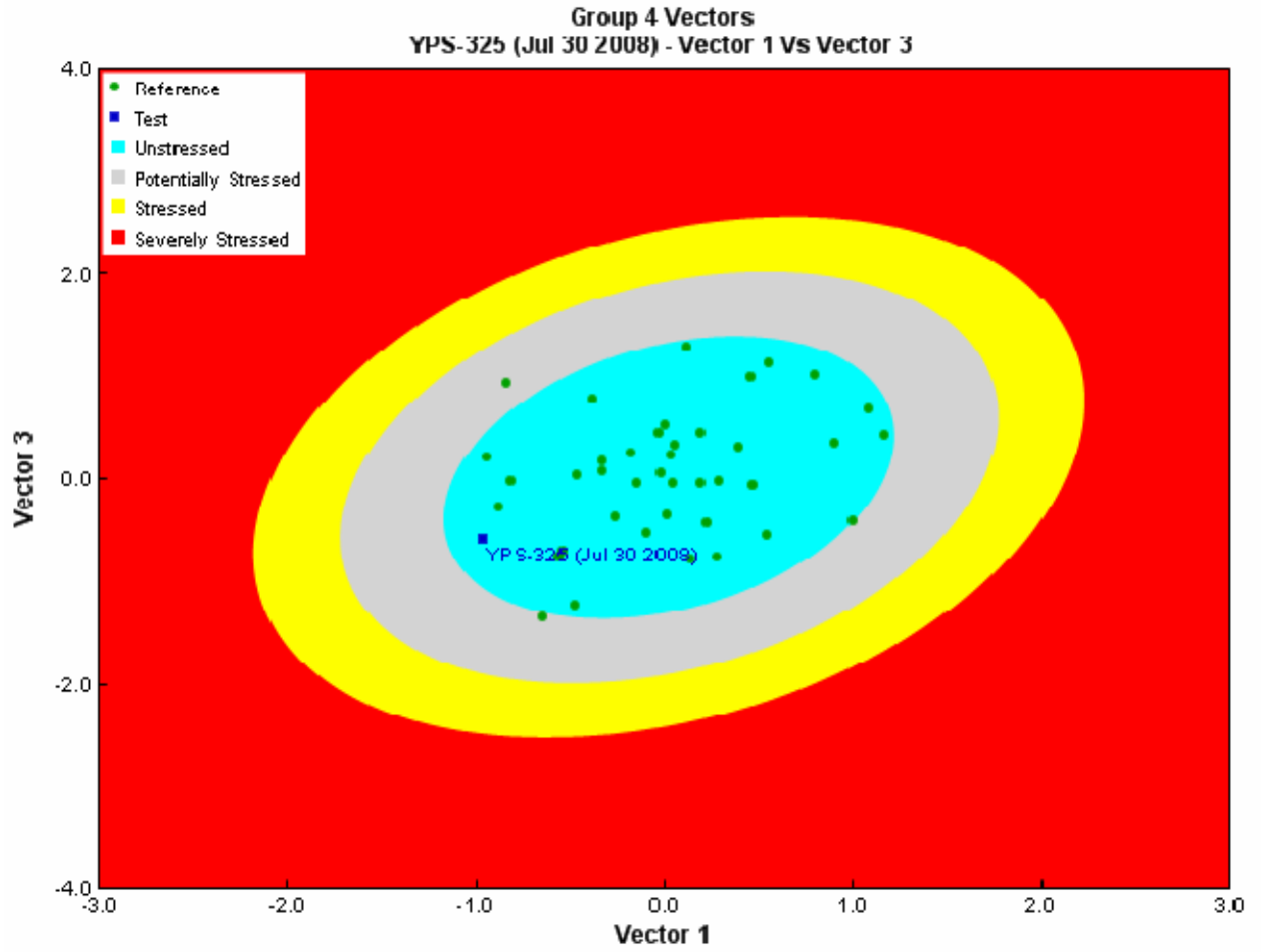
| Description                  | Value   |
|------------------------------|---------|
| Bray-Curtis Distance         | 0.69    |
| Bray Curtis Reference Median | 3038.12 |

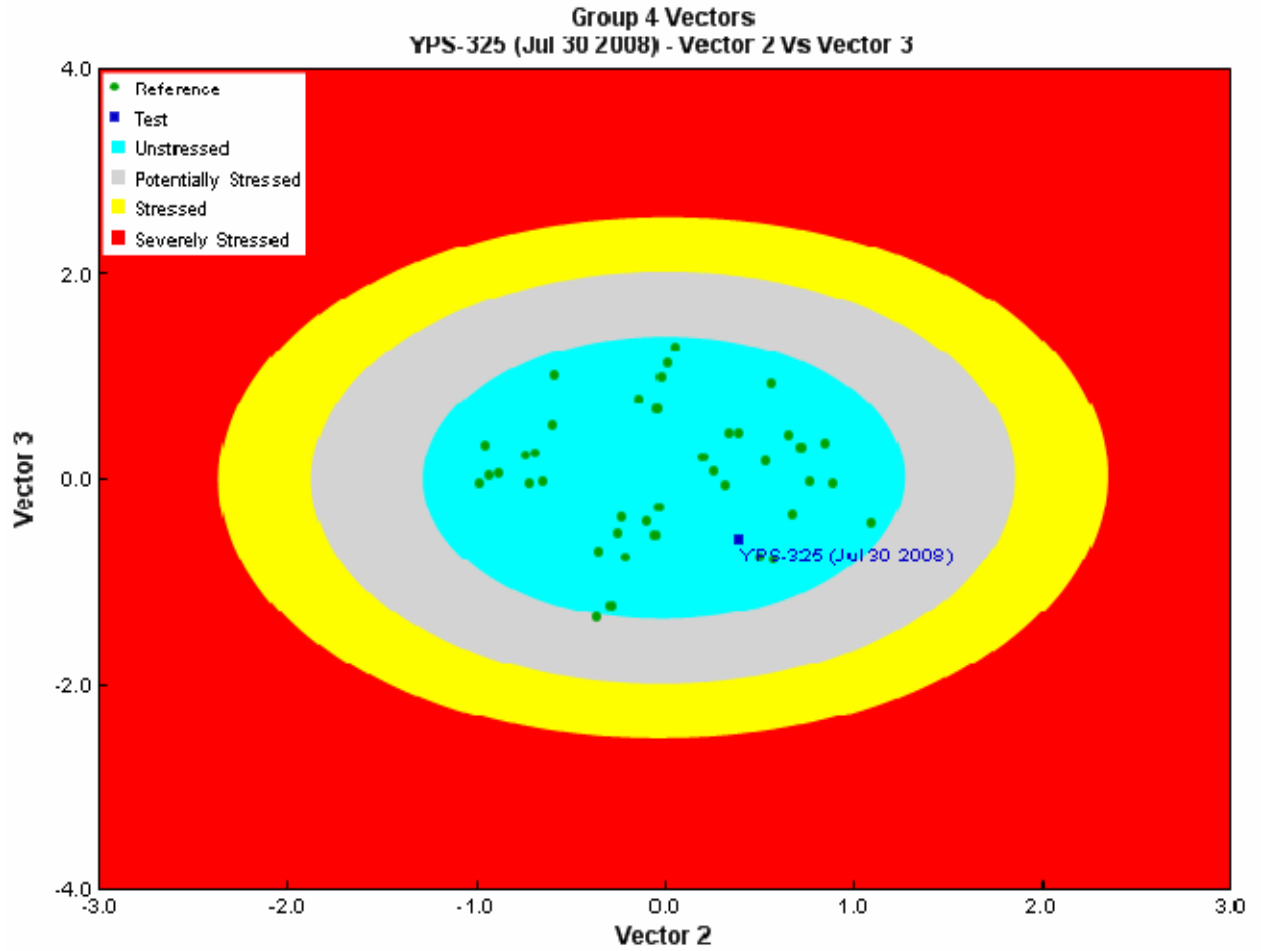
**RIVPACS Analysis**

| Taxa             | Probability of Occurrence | 2008 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                         | 74                   | 705.6  | 949.0  | 6                                   | Insensitive |
| Simuliidae       | 0.88                      | -                    | 197.5  | 362.0  | 6                                   | Insensitive |
| Baetidae         | 0.87                      | 76                   | 531.9  | 1178.0   | 4                                   | Insensitive |
| Nemouridae       | 0.76                      | 120                  | 158.4  | 274.1  | 2                                   | Sensitive   |
| Heptageniidae    | 0.68                      | 278                  | 92.7   | 122.0  | 4                                   | Insensitive |
| Empididae        | 0.57                      | 11                   | 7.9  | 21.3   | 6                                   | Insensitive |
| Tipulidae        | 0.51                      | 2                    | 9.1  | 24.9   | 3                                   | Insensitive |
| Capniidae        | 0.45                      | -                    | 43.7   | 155.1  | 1                                   | Sensitive   |
| Limnephilidae    | 0.4                       | -                    | 20.6   | 59.5   | 4                                   | Insensitive |
| Sperchonidae     | 0.37                      | 20                   | 17.8   | 58.3   | 8                                   | Tolerant    |
| Ameletidae       | 0.36                      | 7                    | 24.4   | 68.3   | 0                                   | Sensitive   |
| Lebertiidae      | 0.33                      | -                    | 10.9   | 26.6   | 8                                   | Tolerant    |
| Perlodidae       | 0.31                      | -                    | 11.6   | 44.0   | 2                                   | Sensitive   |
| Chloroperlidae   | 0.3                       | 78                   | 36.8   | 102.2  | 1                                   | Sensitive   |
| Lumbriculidae    | 0.28                      | -                    | 34.4   | 92.6   | 8                                   | Tolerant    |
| Psychodidae      | 0.24                      | -                    | 4.8  | 15.2   | 10                                  | Tolerant    |
| Ephemerellidae   | 0.23                      | 24                   | 16.8   | 49.3   | 1                                   | Sensitive   |
| Rhyacophilidae   | 0.18                      | 13                   | 4.5  | 17.7   | 0                                   | Sensitive   |
| Naididae         | 0.16                      | -                    | 7.6  | 24.3   | 10                                  | Tolerant    |
| Glossosomatidae  | 0.14                      | -                    | 2.5  | 7.8  | 0                                   | Sensitive   |
| Ceratopogonidae  | 0.11                      | 4                    | 1.7  | 6.8  | 6                                   | Insensitive |
| Dytiscidae       | 0.1                       | -                    | 1.0  | 3.0  | 5                                   | Insensitive |
| Sphaeriidae      | 0.1                       | -                    | 9.4  | 40.6   | 8                                   | Tolerant    |
| Muscidae         | 0.09                      | -                    | 0.3  | 1.0  | 6                                   | Insensitive |
| Brachycentridae  | 0.08                      | -                    | 15.3   | 94.8   | 1                                   | Sensitive   |
| Apataniidae      | 0.07                      | -                    | 21.6   | 126.4  | 1                                   | Sensitive   |
| Hydrozetidae     | 0.07                      | -                    | 0.8  | 4.0  |                                     |             |
| Leptophlebiidae  | 0.07                      | -                    | 12.6   | 54.1   | 2                                   | Sensitive   |
| Lymnaeidae       | 0.07                      | -                    | 2.1  | 10.7   | 6                                   | Insensitive |
| Physidae         | 0.07                      | -                    | 4.3  | 19.7   | 8                                   | Tolerant    |
| Dixidae          | 0.05                      | -                    | 1.2  | 6.7  | 1                                   | Sensitive   |
| Feltriidae       | 0.05                      | -                    | 0.9  | 4.4  |                                     |             |
| Hydroptilidae    | 0.05                      | -                    | 0.9  | 4.8  | 4                                   | Insensitive |
| Lepidostomatidae | 0.05                      | -                    | 23.8   | 150.2  | 3                                   | Insensitive |
| Leuctridae       | 0.05                      | -                    | 0.9  | 5.8  | 0                                   | Sensitive   |
| Planariidae      | 0.05                      | -                    | 1.1  | 5.4  | 1                                   | Sensitive   |
| Torrenticolidae  | 0.05                      | -                    | 3.2  | 18.5   |                                     |             |
| Corixidae        | 0.03                      | -                    | 1.1  | 6.6  |                                     |             |
| Hyalellidae      | 0.03                      | -                    | 0.6  | 3.8  | 8                                   | Tolerant    |
| Hydropsychidae   | 0.03                      | 4                    | 0.0  | 0.2  | 4                                   | Insensitive |

**Site Assessment Graphs**







**Site Assessment Vector Data**

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

**Site Metrics**

| Metric Name       | Test Site | Reference Group Mean | Standard Deviation | Sample Size |
|-------------------|-----------|----------------------|--------------------|-------------|
| Total Abundance   | 717.24    | 2053.1               |                    |             |
| Total No. of Taxa | 14.0      | 10.4                 | 3.5                | 40          |

## Site Assessment Report

### Site Metadata

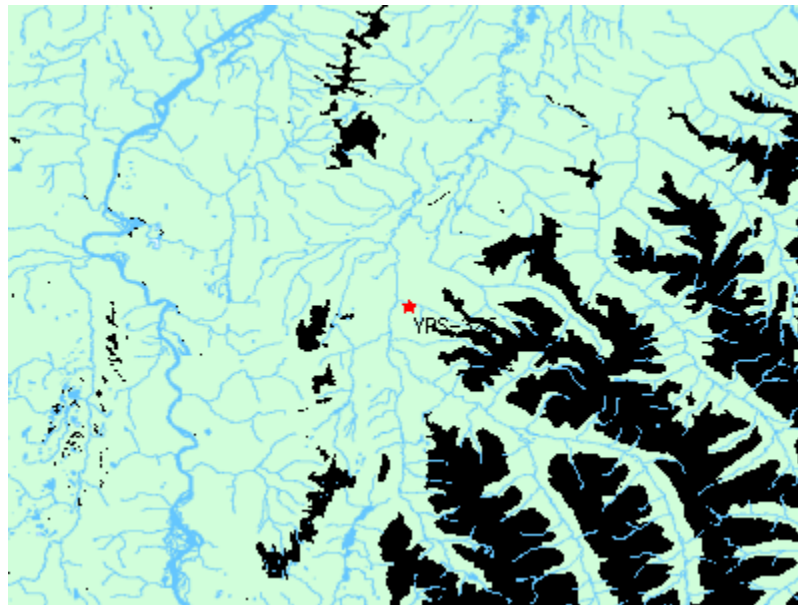
|                     |                 |
|---------------------|-----------------|
| <b>Site</b>         | YPS-326         |
| <b>Sample Date</b>  | Jul 30 2008     |
| <b>Latitude</b>     | N 61° 17' 58.5" |
| <b>Longitude</b>    | W 134° 19' 9.6" |
| <b>Altitude</b>     | 2837            |
| <b>Feature Name</b> | Martin Creek    |
| <b>Stream Order</b> | 2               |

*Aerial*



**Site Photograph**

**Context Map**



**BEAST Prediction Results**

|                               |  |          |          |          |
|-------------------------------|--|----------|----------|----------|
| <b>Predictor Variables</b>    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |          |          |          |
| <b>Predicted Group Number</b> | 4  |          |          |          |
| <b>Group</b>                  | <b>1</b>   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>Probability</b>            | 32.9%  | 12.1%    | 7.5%     | 47.5%    |

**Habitat Attributes**

| Variable   | Site  | Reference Group Mean | Standard Deviation | Sample Size |
|--|-------|----------------------|--------------------|-------------|
| Canopy - % coverage (PercentRange)                     | 4     | 1.516129             | 1.179575           | 31          |
| Channel Depth - max (cm)                               | 15    | 26.74793             | 19.12511           | 29          |
| General - pH (pH)                                      | 7.3   | 7.81025              | 0.629475           | 40          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 169.8 | 251.6188             | 183.3222           | 32          |
| General - Turbidity (NTU)                              | 0     | 1.467333             | 3.130127           | 15          |
| Landcover – Alpine (%)                                 | 40.6  | 0.311484             | 0.321628           | 40          |
| Landcover – Lake (%)                                   | 0     | 0.006318             | 0.022385           | 40          |
| Nitrogen - nitrate + nitrite (mg/L)                    | 0.04  | 0.0019               |                    | 1           |
| Precip Rainfall JUN (mm) (mm)                          | 30.5  | 42.56                | 8.344591           | 40          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 144.6 | 123.515              | 13.76934           | 40          |
| Solids - total suspended (TSS) (mg/L)                  | 0.8   | 5.9704               | 6.025369           | 25          |
| Substrate - embeddedness category (Category(1-5))      | 4     | 3.870968             | 0.884757           | 31          |
| Temperature - lake surface or stream (Degrees Celsius) | 7.51  | 8.175897             | 3.335357           | 39          |
| Velocity (Avg) (m/s)                                   | 0.32  | 0.50987              | 0.879644           | 40          |
| Width - Wetted (m)                                     | 1.8   | 5.6435               | 4.464378           | 40          |

**Bray-Curtis Analysis**

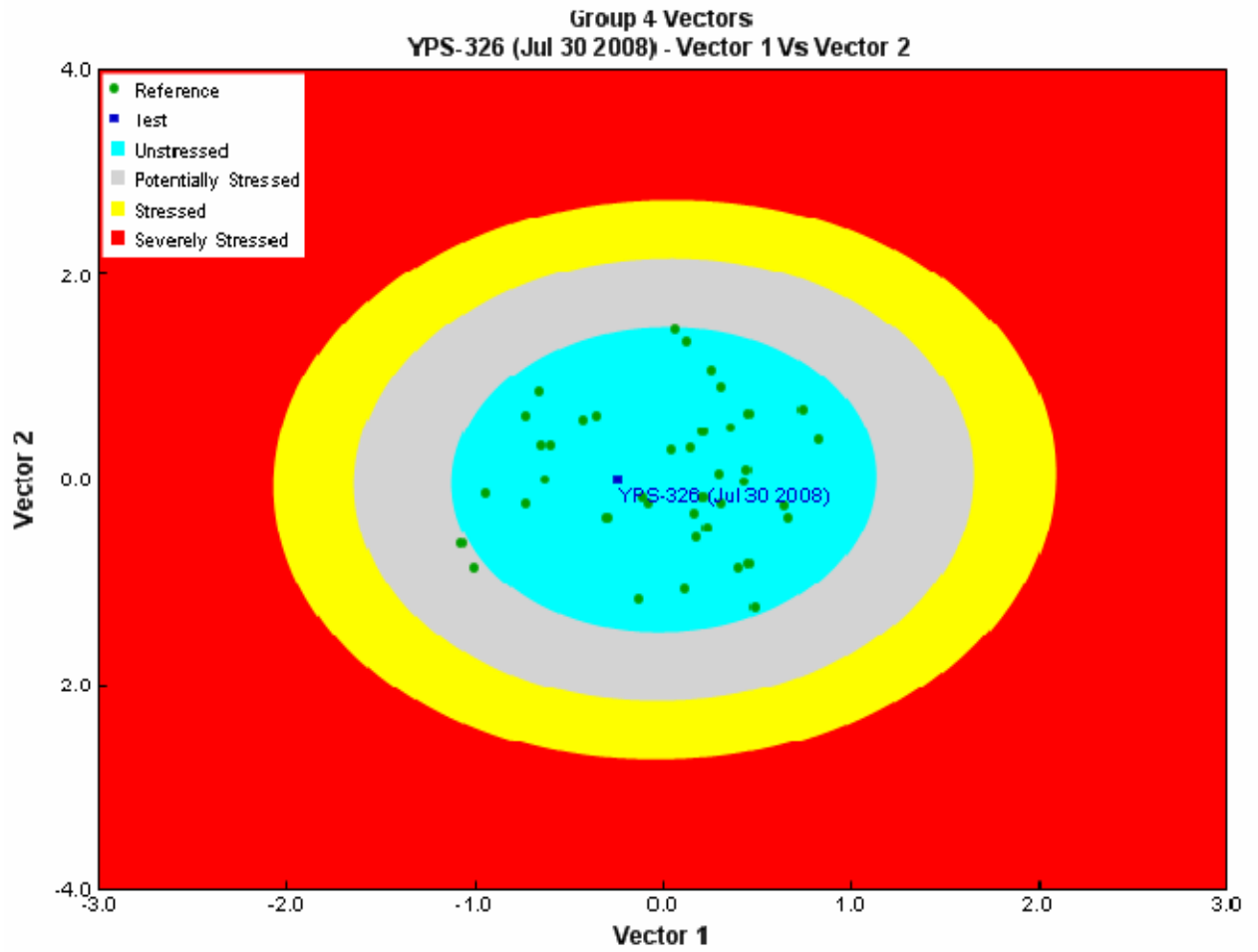
| Description                  | Value   |
|------------------------------|---------|
| Bray-Curtis Distance         | 0.81    |
| Bray Curtis Reference Median | 3038.12 |

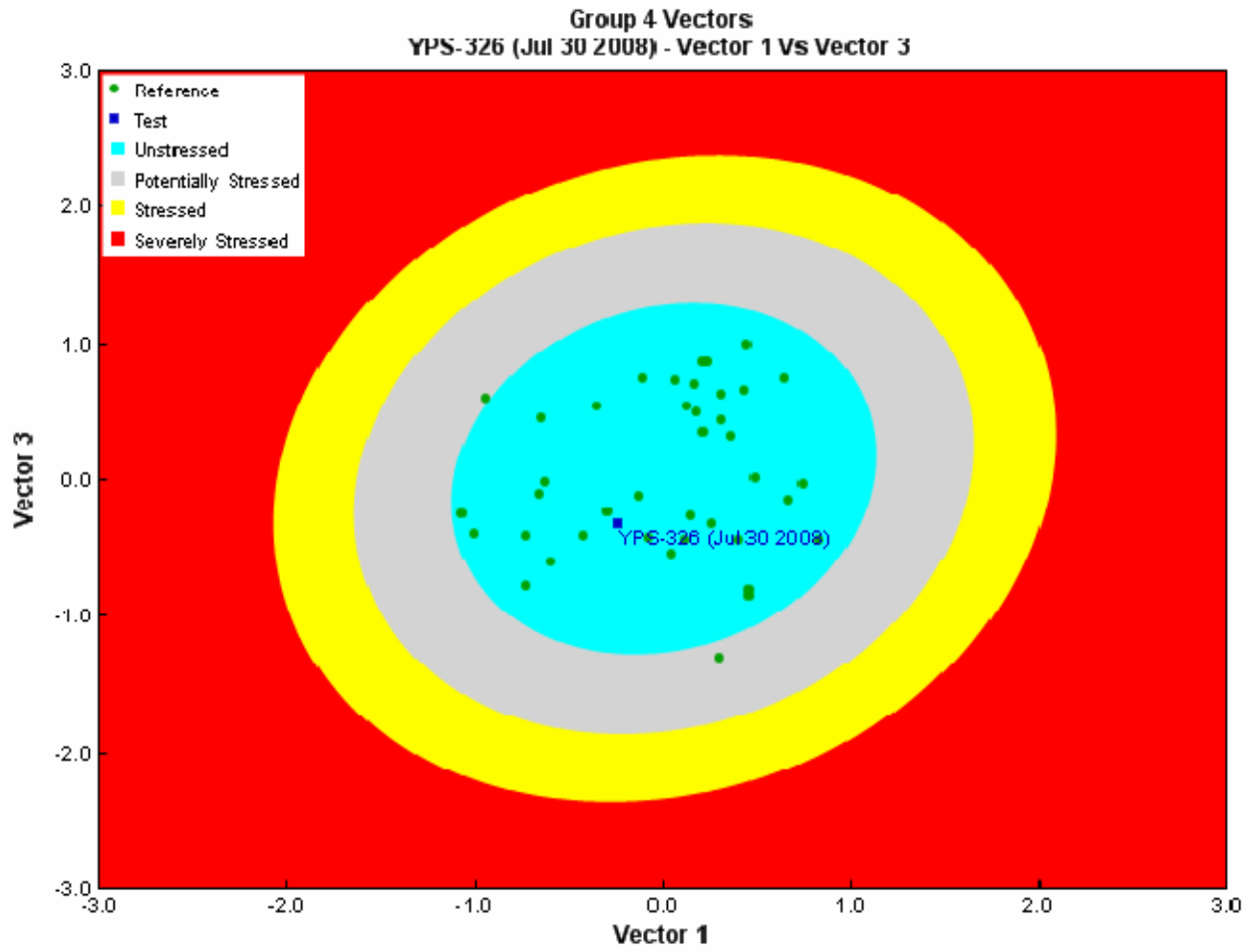


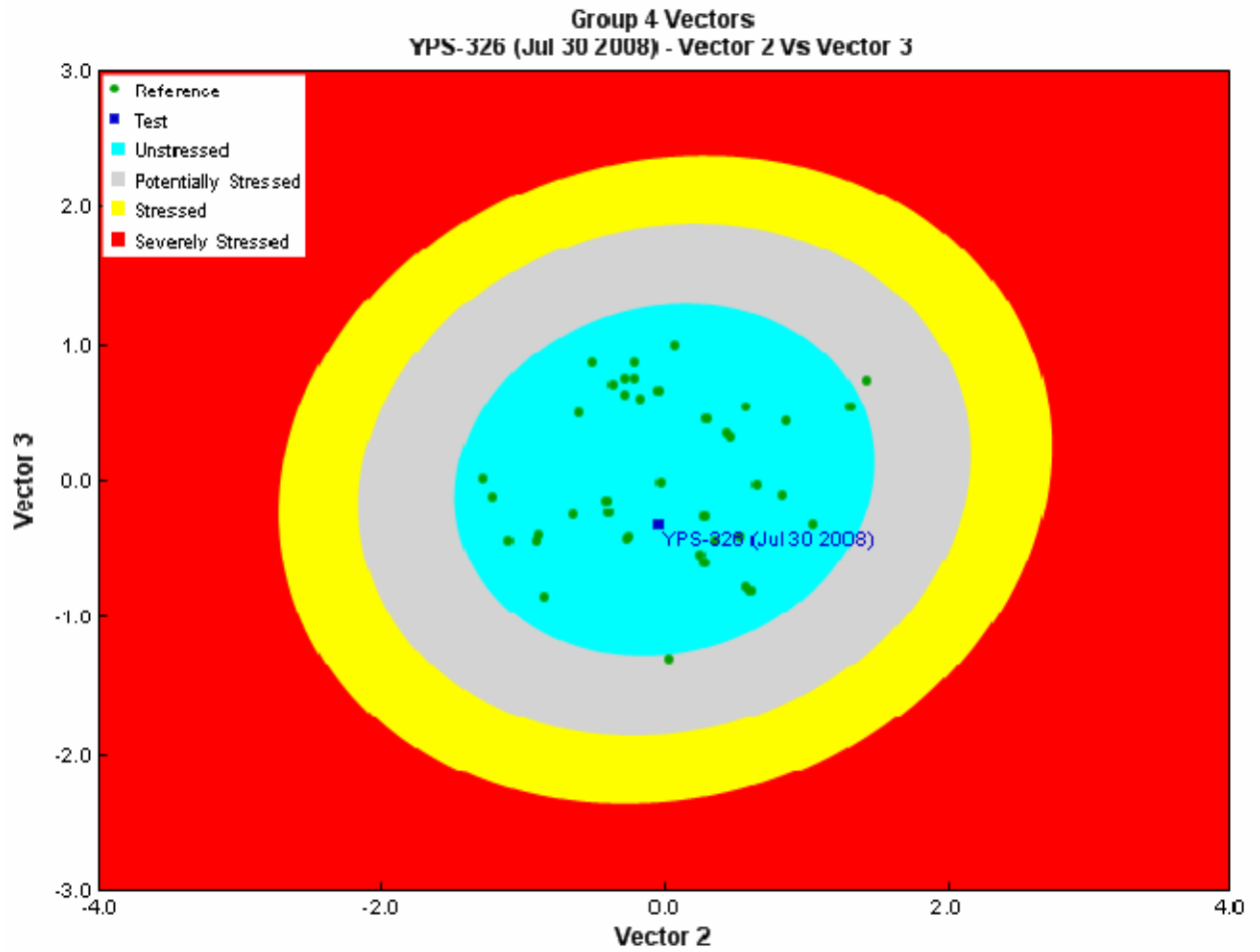
**RIVPACS Analysis**

| Taxa            | Probability of Occurrence | 2008 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                      | 608                  | 705.6  | 949.0  | 6                                   | Insensitive |
| Baetidae        | 0.83                      | 562                  | 531.9  | 1178.0   | 4                                   | Insensitive |
| Simuliidae      | 0.82                      | 15                   | 197.5  | 362.0  | 6                                   | Insensitive |
| Nemouridae      | 0.74                      | 446                  | 158.4  | 274.1  | 2                                   | Sensitive   |
| Heptageniidae   | 0.65                      | 838                  | 92.7   | 122.0  | 4                                   | Insensitive |
| Empididae       | 0.49                      | 46                   | 7.9  | 21.3   | 6                                   | Insensitive |
| Tipulidae       | 0.46                      | -                    | 9.1  | 24.9   | 3                                   | Insensitive |
| Limnephilidae   | 0.43                      | -                    | 20.6   | 59.5   | 4                                   | Insensitive |
| Sperchonidae    | 0.4                       | 8                    | 17.8   | 58.3   | 8                                   | Tolerant    |
| Chloroperlidae  | 0.35                      | -                    | 36.8   | 102.2  | 1                                   | Sensitive   |
| Ameletidae      | 0.33                      | 8                    | 24.4   | 68.3   | 0                                   | Sensitive   |
| Capniidae       | 0.32                      | -                    | 43.7   | 155.1  | 1                                   | Sensitive   |
| Ephemerellidae  | 0.31                      | 8                    | 16.8   | 49.3   | 1                                   | Sensitive   |
| Perlodidae      | 0.29                      | 31                   | 11.6   | 44.0   | 2                                   | Sensitive   |
| Naididae        | 0.28                      | -                    | 7.6  | 24.3   | 10                                  | Tolerant    |
| Lebertiidae     | 0.26                      | -                    | 10.9   | 26.6   | 8                                   | Tolerant    |
| Lumbriculidae   | 0.25                      | -                    | 34.4   | 92.6   | 8                                   | Tolerant    |
| Rhyacophilidae  | 0.24                      | 8                    | 4.5  | 17.7   | 0                                   | Sensitive   |
| Psychodidae     | 0.2                       | 8                    | 4.8  | 15.2   | 10                                  | Tolerant    |
| Ceratopogonidae | 0.18                      | -                    | 1.7  | 6.8  | 6                                   | Insensitive |
| Glossosomatidae | 0.14                      | 8                    | 2.5  | 7.8  | 0                                   | Sensitive   |
| Dytiscidae      | 0.11                      | -                    | 1.0  | 3.0  | 5                                   | Insensitive |
| Sphaeriidae     | 0.1                       | -                    | 9.4  | 40.6   | 8                                   | Tolerant    |
| Brachycentridae | 0.09                      | -                    | 15.3   | 94.8   | 1                                   | Sensitive   |
| Lymnaeidae      | 0.09                      | -                    | 2.1  | 10.7   | 6                                   | Insensitive |
| Hydropsychidae  | 0.08                      | 8                    | 0.0  | 0.2  | 4                                   | Insensitive |

Site Assessment Graphs







**Site Assessment Vector Data**

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

**Site Metrics**

| Metric Name       | Test Site | Reference Group Mean | Standard Deviation | Sample Size |
|-------------------|-----------|----------------------|--------------------|-------------|
| Total Abundance   | 2599.9    | 2053.1               |                    |             |
| Total No. of Taxa | 14.0      | 10.4                 | 3.5                | 40          |

## Site Assessment Report

### Site Metadata

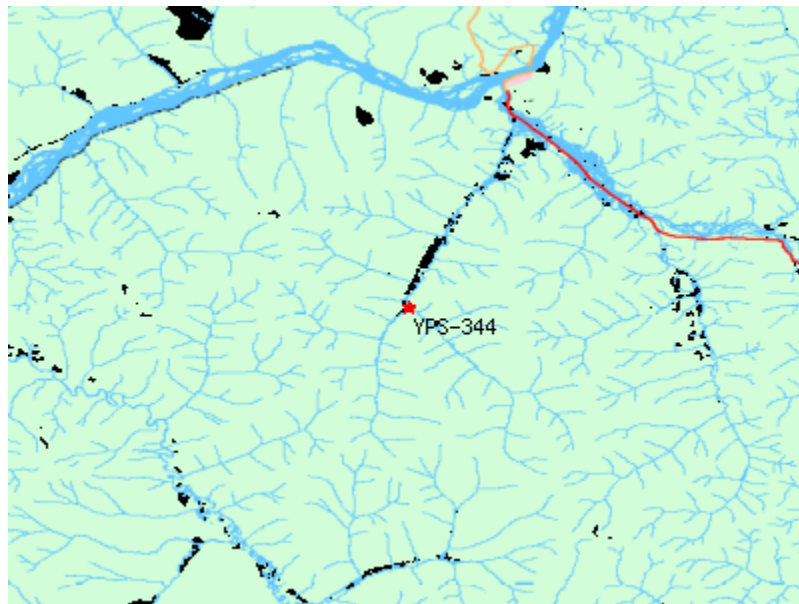
|                     |                |
|---------------------|----------------|
| <b>Site</b>         | YPS-344        |
| <b>Sample Date</b>  | Aug 06 2008    |
| <b>Latitude</b>     | N 63° 55' 14"  |
| <b>Longitude</b>    | W 139° 18' 58" |
| <b>Altitude</b>     | 1640           |
| <b>Feature Name</b> | Bonanza Creek  |
| <b>Stream Order</b> | 4              |

### Site Photograph

*Up Stream*



### Context Map



### BEAST Prediction Results

|                               |  |          |          |          |
|-------------------------------|--|----------|----------|----------|
| <b>Predictor Variables</b>    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |          |          |          |
| <b>Predicted Group Number</b> | 2  |          |          |          |
| <b>Group</b>                  | <b>1</b>   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>Probability</b>            | 16.1%  | 41.9%    | 32.6%    | 9.4%     |

**Habitat Attributes**

| Variable   | Site   | Reference Group Mean | Standard Deviation | Sample Size |
|--|--------|----------------------|--------------------|-------------|
| Canopy - % coverage (PercentRange)                     | 1      | 1.666666667          | 1.073087           | 12          |
| Channel Depth - avg (cm)                               | 21.2   | 31.45833333          | 18.58941           | 12          |
| General - pH (pH)                                      | 6.9    | 7.651333333          | 0.808761           | 45          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 219    | 239.05               | 134.161            | 44          |
| Landcover – Alpine (%)                                 | 1.3    | 0.143083016          | 0.219036           | 45          |
| Landcover – Lake (%)                                   | 0      | 0.005649687          | 0.014997           | 45          |
| Nitrogen - nitrate + nitrite (mg/L)                    | 0.03   | 0.090714286          |                    | 21          |
| Precip Rainfall JUN (mm) (mm)                          | 37     | 36.99777778          | 7.555326           | 45          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 114.8  | 129.6066667          | 19.21532           | 45          |
| Solids - total suspended (TSS) (mg/L)                  | 26.125 | 11.17837838          | 30.64302           | 37          |
| Substrate - embeddedness category (Category(1-5))      | 4      | 3.666666667          | 0.778499           | 12          |
| Temperature - lake surface or stream (Degrees Celsius) | 9.75   | 10.41333333          | 3.98499            | 45          |
| Velocity (Avg) (m/s)                                   | 0.53   | 0.3616               | 0.227003           | 45          |
| Width - Wetted (m)                                     | 5.8    | 5.386666667          | 3.792933           | 45          |

**Bray-Curtis Analysis**

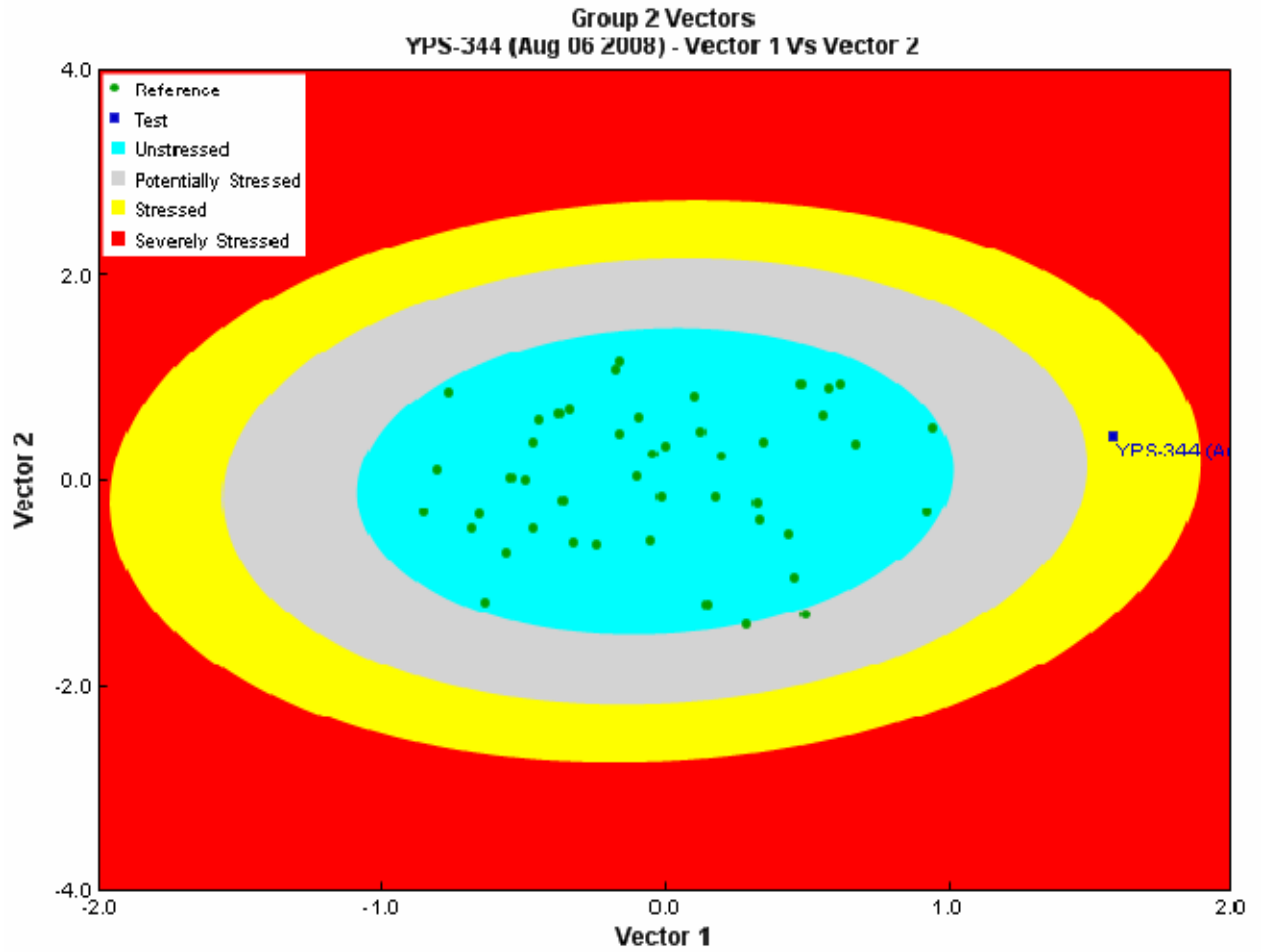
| Description                  | Value  |
|------------------------------|--------|
| Bray-Curtis Distance         | 0.18   |
| Bray Curtis Reference Median | 465.94 |

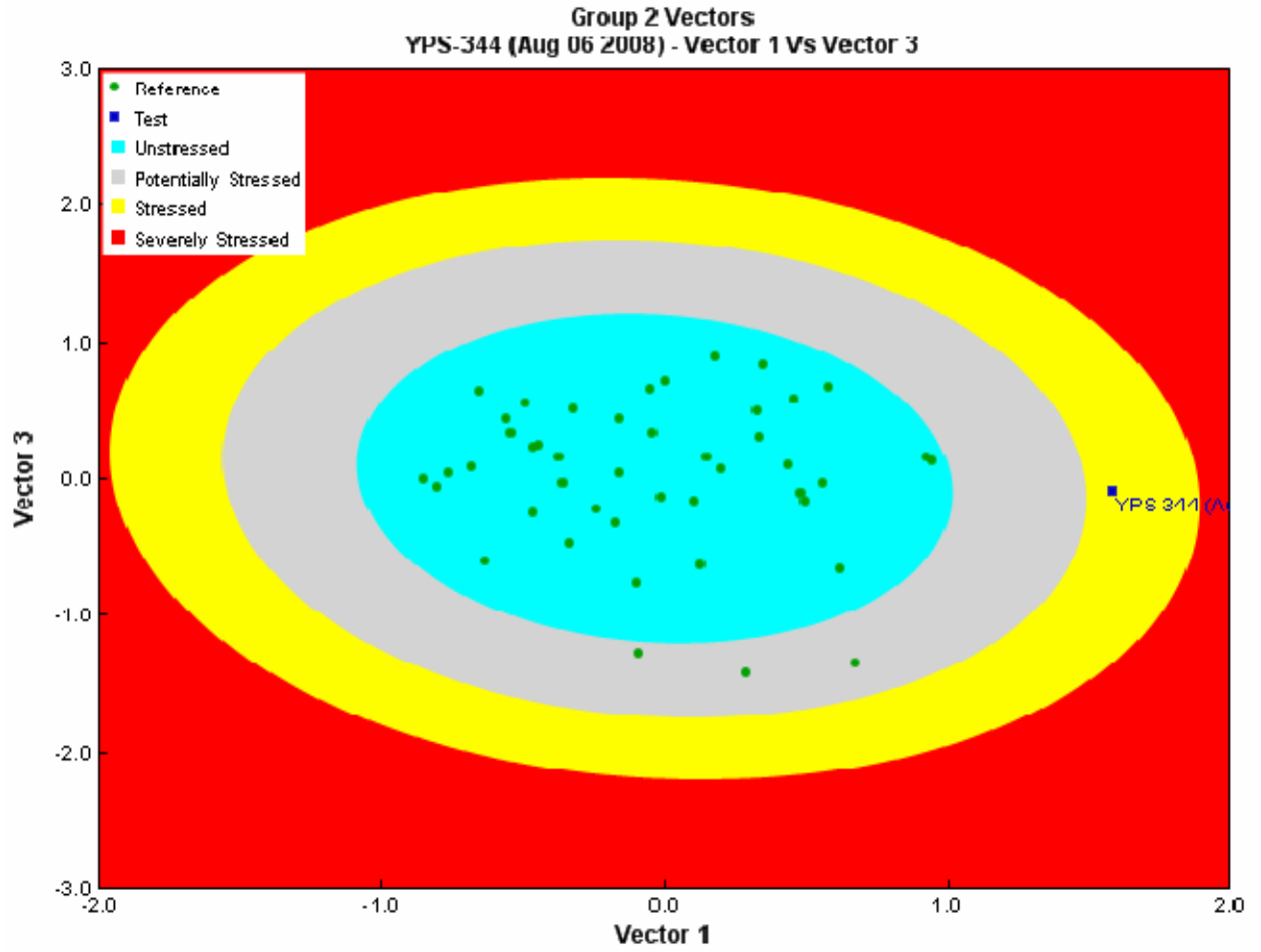
**RIVPACS Analysis**

| Taxa            | Probability of Occurrence | 2008 Total Abundance | Mean of Abundance for Reference sites in Group 2 | SD of Abundance for Reference sites in Group 2 | Benthic Invertebrate Taxa Tolerance |             |
|-----------------|---------------------------|----------------------|--|--|-------------------------------------|-------------|
| Chironomidae    | 0.99                      | 42                   | 153.3  | 61.2   | 6                                   | Insensitive |
| Simuliidae      | 0.64                      | 1                    | 11.1   | 16.4   | 6                                   | Insensitive |
| Baetidae        | 0.62                      | 42                   | 22.2   | 32.7   | 4                                   | Insensitive |
| Nemouridae      | 0.59                      | 8                    | 9.2  | 14.0   | 2                                   | Sensitive   |
| Heptageniidae   | 0.45                      | 5                    | 9.0  | 14.9   | 4                                   | Insensitive |
| Tipulidae       | 0.42                      | 4                    | 2.3  | 3.4  | 3                                   | Insensitive |
| Sperchonidae    | 0.37                      | -                    | 3.9  | 6.2  | 8                                   | Tolerant    |
| Limnephilidae   | 0.36                      | -                    | 2.6  | 5.0  | 4                                   | Insensitive |
| Empididae       | 0.32                      | 4                    | 2.3  | 4.5  | 6                                   | Insensitive |
| Naididae        | 0.32                      | 2                    | 5.2  | 11.0   | 10                                  | Tolerant    |
| Chloroperlidae  | 0.31                      | 2                    | 6.0  | 21.9   | 1                                   | Sensitive   |
| Lumbriculidae   | 0.29                      | -                    | 7.7  | 17.9   | 8                                   | Tolerant    |
| Ephemerellidae  | 0.27                      | -                    | 3.7  | 12.9   | 1                                   | Sensitive   |
| Ameletidae      | 0.24                      | -                    | 0.8  | 1.7  | 0                                   | Sensitive   |
| Ceratopogonidae | 0.23                      | -                    | 5.1  | 29.8   | 6                                   | Insensitive |
| Rhyacophilidae  | 0.22                      | -                    | 1.6  | 3.6  | 0                                   | Sensitive   |

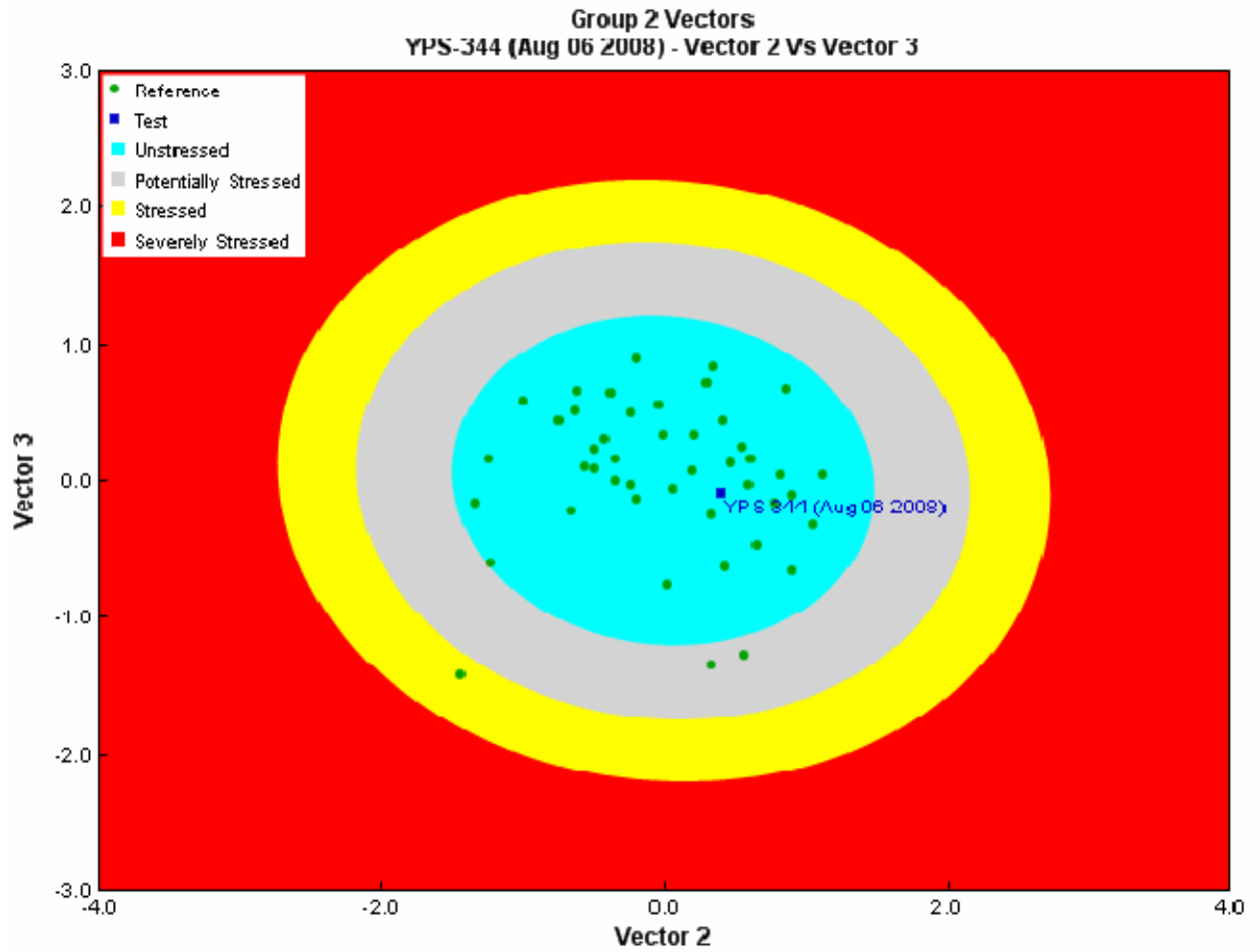
|                 |      |   |     |     |    |             |
|-----------------|------|---|-----|-----|----|-------------|
| Capniidae       | 0.2  | - | 2.0 | 6.4 | 1  | Sensitive   |
| Perlodidae      | 0.2  | 1 | 0.9 | 2.0 | 2  | Sensitive   |
| Psychodidae     | 0.19 | - | 0.5 | 1.4 | 10 | Tolerant    |
| Lebertiidae     | 0.18 | - | 1.8 | 4.4 | 8  | Tolerant    |
| Dytiscidae      | 0.13 | - | 0.6 | 1.7 | 5  | Insensitive |
| Brachycentridae | 0.1  | 1 | 0.8 | 2.8 | 1  | Sensitive   |

**Site Assessment Graphs**









**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   | 113.0     | 262.0                |                    |             |
| Total No. of Taxa | 12.0      | 10.4                 | 4.1                | 45          |

# Site Assessment Report

## Site Metadata

|              |                |
|--------------|----------------|
| Site         | YPS-347        |
| Sample Date  | Aug 07 2008    |
| Latitude     | N 63° 50' 44"  |
| Longitude    | W 137° 12' 50" |
| Altitude     |                |
| Feature Name | Clear Creek    |
| Stream Order | 3              |

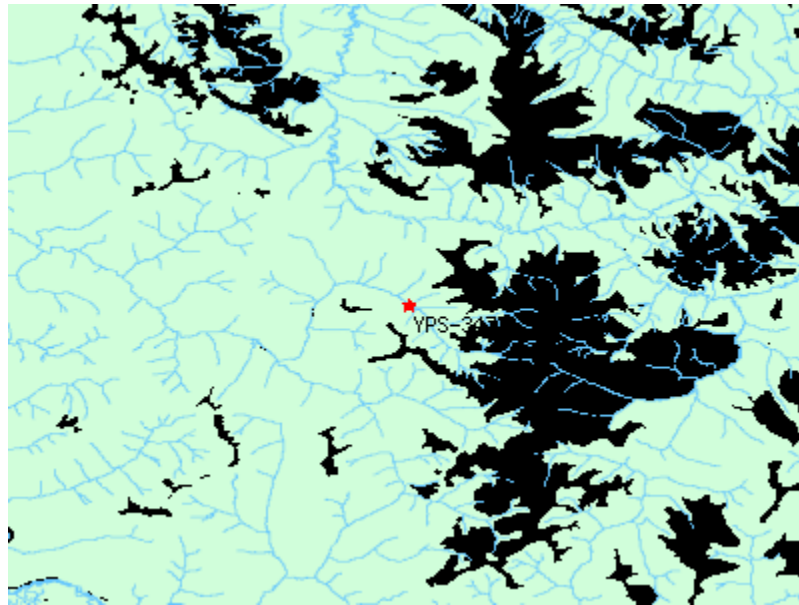
## Site Photograph

*Up Stream*



Clear Creek

Context Map



**BEAST Prediction Results**

|                               |  |          |          |          |
|-------------------------------|--|----------|----------|----------|
| <b>Predictor Variables</b>    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |          |          |          |
| <b>Predicted Group Number</b> | 4  |          |          |          |
| <b>Group</b>                  | <b>1</b>   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>Probability</b>            | 21.6%  | 12.5%    | 14.2%    | 51.8%    |

**Habitat Attributes**

| Variable   | Site | Reference Group Mean | Standard Deviation | Sample Size |
|--|------|----------------------|--------------------|-------------|
| Canopy - % coverage (PercentRange)                     | 1    | 1.516129             | 1.179575           | 31          |
| Channel Depth - avg (cm)                               | 17.8 | 26.74793             | 19.12511           | 29          |
| General - pH (pH)                                      | 7.1  | 7.81025              | 0.629475           | 40          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 71   | 251.6188             | 183.3222           | 32          |
| General - Turbidity (NTU)                              | 0    | 1.467333             | 3.130127           | 15          |
| Landcover – Alpine (%)                                 | 49.7 | 0.311484             | 0.321628           | 40          |
| Landcover – Lake (%)                                   | 0    | 0.006318             | 0.022385           | 40          |
| Nitrogen - nitrate + nitrite (mg/L)                    | 0.08 | 0.0019               |                    | 1           |
| Precip Rainfall JUN (mm) (mm)                          | 39.4 | 42.56                | 8.344591           | 40          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 138  | 123.515              | 13.76934           | 40          |
| Solids - total suspended (TSS) (mg/L)                  | 0.25 | 5.9704               | 6.025369           | 25          |
| Substrate - embeddedness category (Category(1-5))      | 4    | 3.870968             | 0.884757           | 31          |
| Temperature - lake surface or stream (Degrees Celsius) | 4.97 | 8.175897             | 3.335357           | 39          |
| Velocity (Avg) (m/s)                                   | 0.57 | 0.50987              | 0.879644           | 40          |
| Width - Wetted (m)                                     | 0.57 | 1.516129             | 4.464378           | 40          |

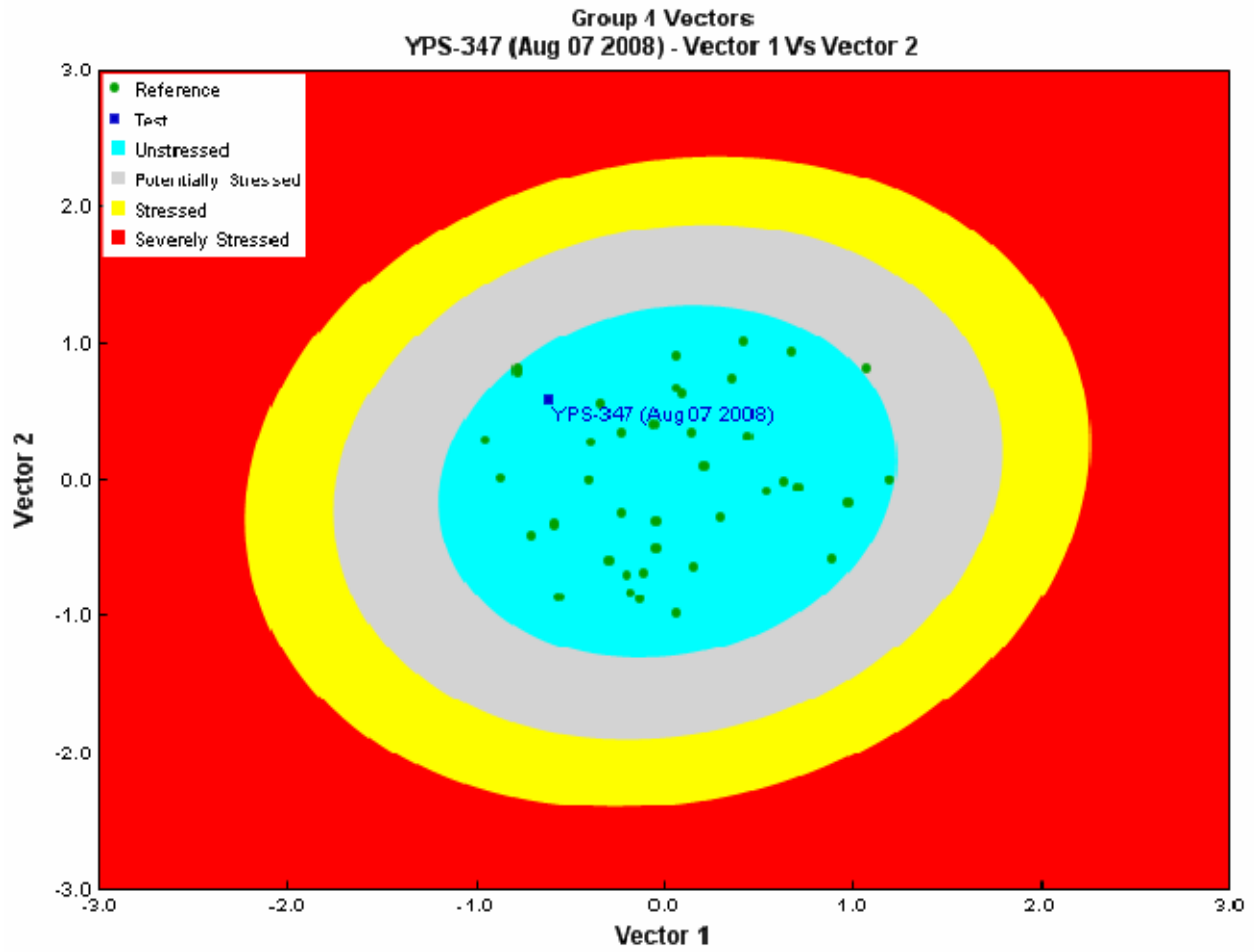
**Bray-Curtis Analysis**

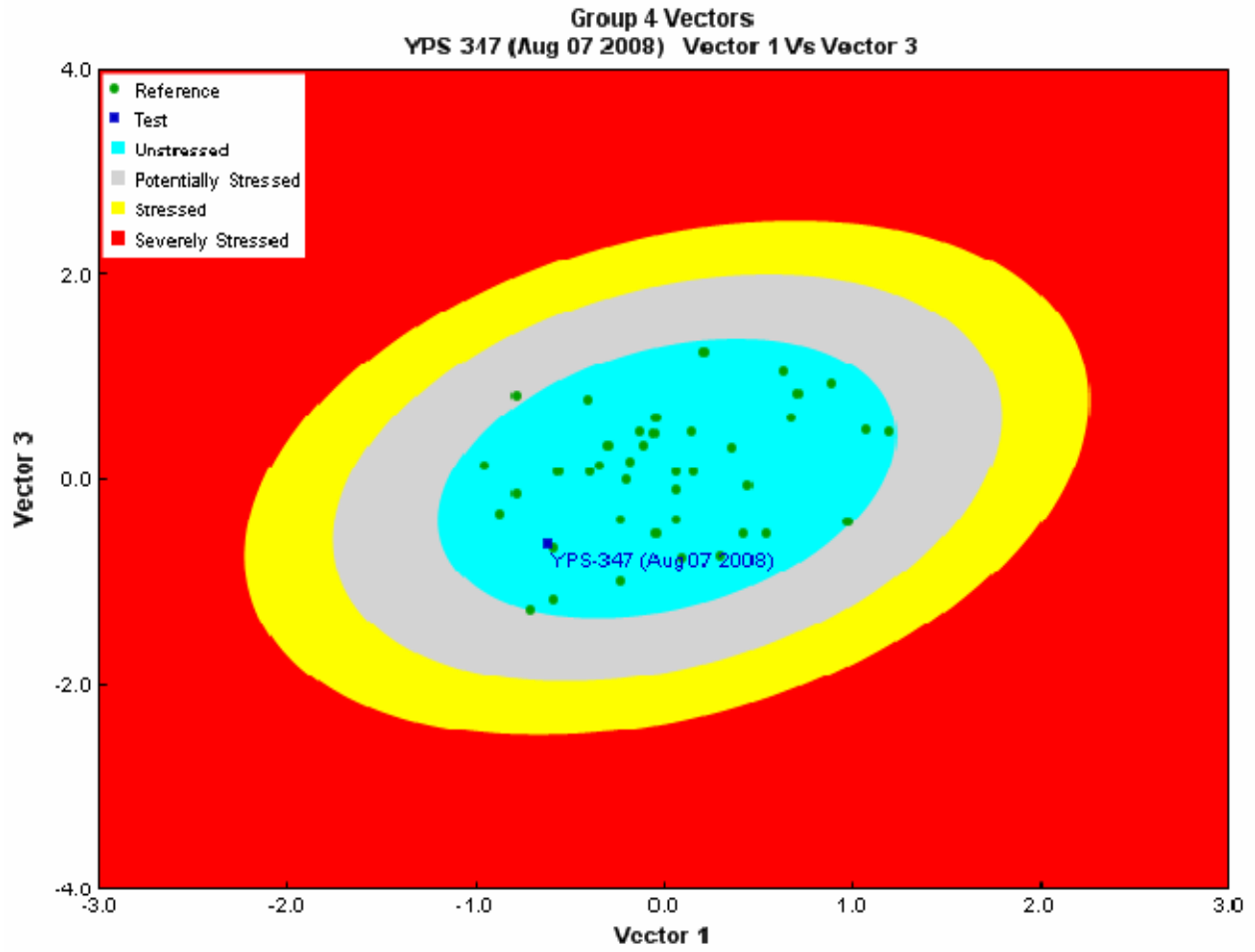
| Description                  | Value   |
|------------------------------|---------|
| Bray-Curtis Distance         | 0.76    |
| Bray Curtis Reference Median | 3038.12 |

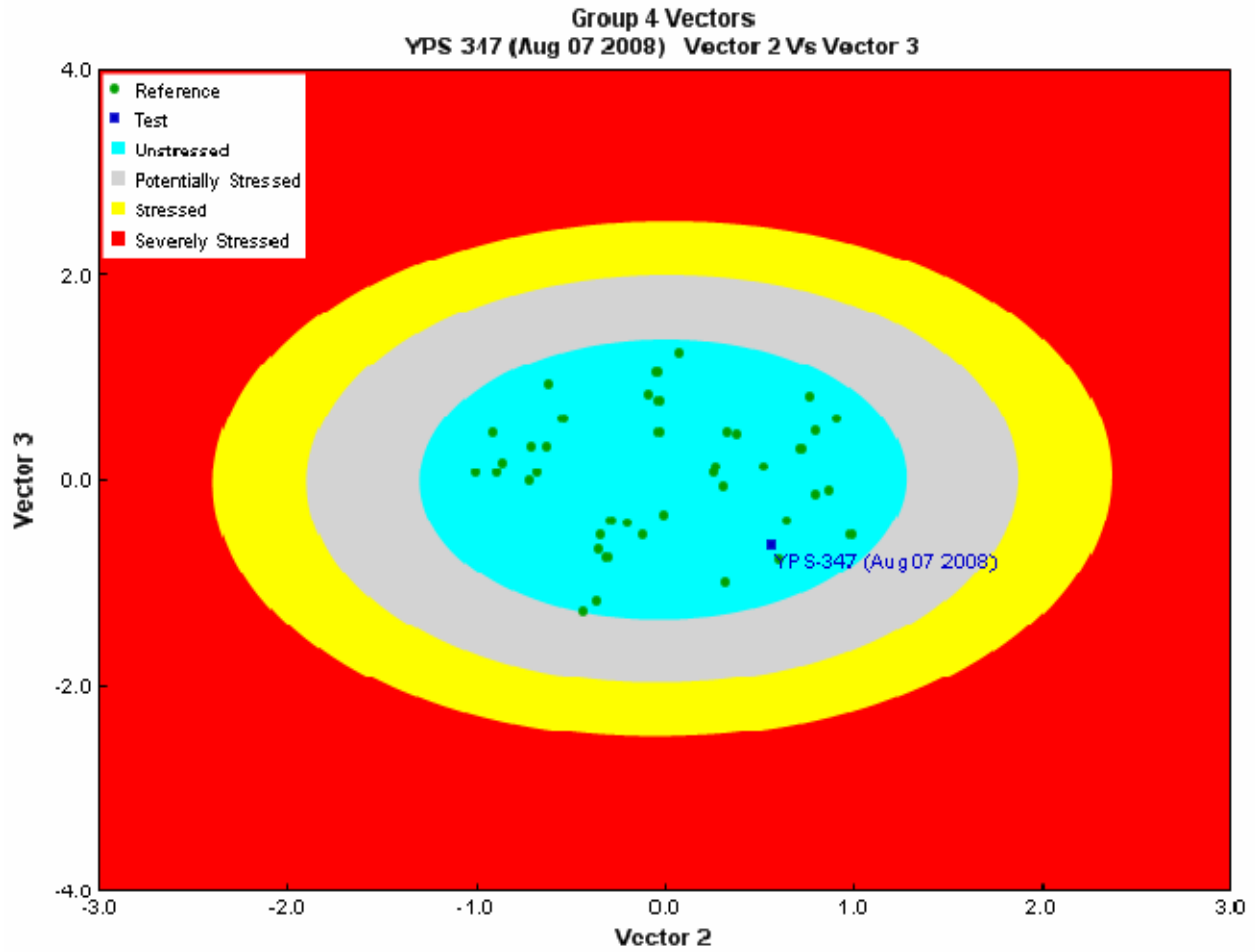
**RIVPACS Analysis**

| Taxa            | Probability of Occurrence | 2008 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                      | 163                  | 705.6  | 949.0  | 6                                   | Insensitive |
| Baetidae        | 0.79                      | 137                  | 531.9  | 1178.0   | 4                                   | Insensitive |
| Simuliidae      | 0.79                      | 16                   | 197.5  | 362.0  | 6                                   | Insensitive |
| Nemouridae      | 0.71                      | 200                  | 158.4  | 274.1  | 2                                   | Sensitive   |
| Heptageniidae   | 0.61                      | 579                  | 92.7   | 122.0  | 4                                   | Insensitive |
| Empididae       | 0.47                      | 232                  | 7.9  | 21.3   | 6                                   | Insensitive |
| Tipulidae       | 0.46                      | 11                   | 9.1  | 24.9   | 3                                   | Insensitive |
| Limnephilidae   | 0.39                      | -                    | 20.6   | 59.5   | 4                                   | Insensitive |
| Sperchonidae    | 0.37                      | 11                   | 17.8   | 58.3   | 8                                   | Tolerant    |
| Capniidae       | 0.33                      | 42                   | 43.7   | 155.1  | 1                                   | Sensitive   |
| Chloroperlidae  | 0.33                      | 74                   | 36.8   | 102.2  | 1                                   | Sensitive   |
| Ameletidae      | 0.31                      | -                    | 24.4   | 68.3   | 0                                   | Sensitive   |
| Ephemerellidae  | 0.28                      | 89                   | 16.8   | 49.3   | 1                                   | Sensitive   |
| Perlodidae      | 0.27                      | 5                    | 11.6   | 44.0   | 2                                   | Sensitive   |
| Lebertiidae     | 0.26                      | -                    | 10.9   | 26.6   | 8                                   | Tolerant    |
| Lumbriculidae   | 0.26                      | 11                   | 34.4   | 92.6   | 8                                   | Tolerant    |
| Naididae        | 0.26                      | -                    | 7.6  | 24.3   | 10                                  | Tolerant    |
| Psychodidae     | 0.21                      | 5                    | 4.8  | 15.2   | 10                                  | Tolerant    |
| Rhyacophilidae  | 0.21                      | 79                   | 4.5  | 17.7   | 0                                   | Sensitive   |
| Ceratopogonidae | 0.17                      | 16                   | 1.7  | 6.8  | 6                                   | Insensitive |

**Site Assessment Graphs**







**Site Assessment Vector Data**

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

**Site Metrics**

| Metric Name       | Test Site | Reference Group Mean | Standard Deviation | Sample Size |
|-------------------|-----------|----------------------|--------------------|-------------|
| Total Abundance   | 1689.32   | 2053.1               |                    |             |
| Total No. of Taxa | 17.0      | 10.4                 | 3.5                | 40          |

## Site Assessment Report

### Site Metadata

|              |               |
|--------------|---------------|
| Site         | YPS-348       |
| Sample Date  | Aug 07 2008   |
| Latitude     | N 63° 43' 54" |
| Longitude    | W 137° 38' 6" |
| Altitude     |               |
| Feature Name | Clear Creek   |
| Stream Order | 4             |

### Site Photograph

*Up Stream*



### Context Map





**BEAST Prediction Results**

|                               |  |          |          |          |
|-------------------------------|--|----------|----------|----------|
| <b>Predictor Variables</b>    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |          |          |          |
| <b>Predicted Group Number</b> | 1  |          |          |          |
| <b>Group</b>                  | <b>1</b>   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>Probability</b>            | 50.3%  | 28.6%    | 13.2%    | 7.9%     |

**Habitat Attributes**

| Variable   | Site  | Reference Group Mean | Standard Deviation | Sample Size |
|--|-------|----------------------|--------------------|-------------|
| Canopy - % coverage (PercentRange)                     | 1     | 1.416667             | 0.792961           | 12          |
| Channel Depth - avg (cm)                               | 47.6  | 35.59091             | 21.62038           | 11          |
| General - pH (pH)                                      | 7.4   | 7.803396             | 0.587259           | 53          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 169   | 181.851              | 116.1537           | 51          |
| General - Turbidity (NTU)                              | 2     | 0.41                 | 0                  | 1           |
| Landcover – Alpine (%)                                 | 8     | 0.277752             | 0.278192           | 53          |
| Landcover – Lake (%)                                   | 0     | 0.011838             | 0.033063           | 53          |
| Nitrogen - nitrate + nitrite (mg/L)                    | 0.02  | 0.062027             |                    | 37          |
| Precip Rainfall JUN (mm) (mm)                          | 39.4  | 33.40377             | 6.066965           | 53          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 158.1 | 138.7642             | 23.56304           | 53          |
| Solids - total suspended (TSS) (mg/L)                  | 1.9   | 9.192857             | 13.45555           | 42          |
| Substrate - embeddedness category (Category(1-5))      | 3     | 3.666667             | 1.073087           | 12          |
| Temperature - lake surface or stream (Degrees Celsius) | 8.14  | 9.95                 | 3.661989           | 53          |
| Velocity (Avg) (m/s)                                   | 0.38  | 0.512523             | 0.310606           | 53          |
| Width - Wetted (m)                                     | 11.6  | 5.858113             | 4.958505           | 53          |

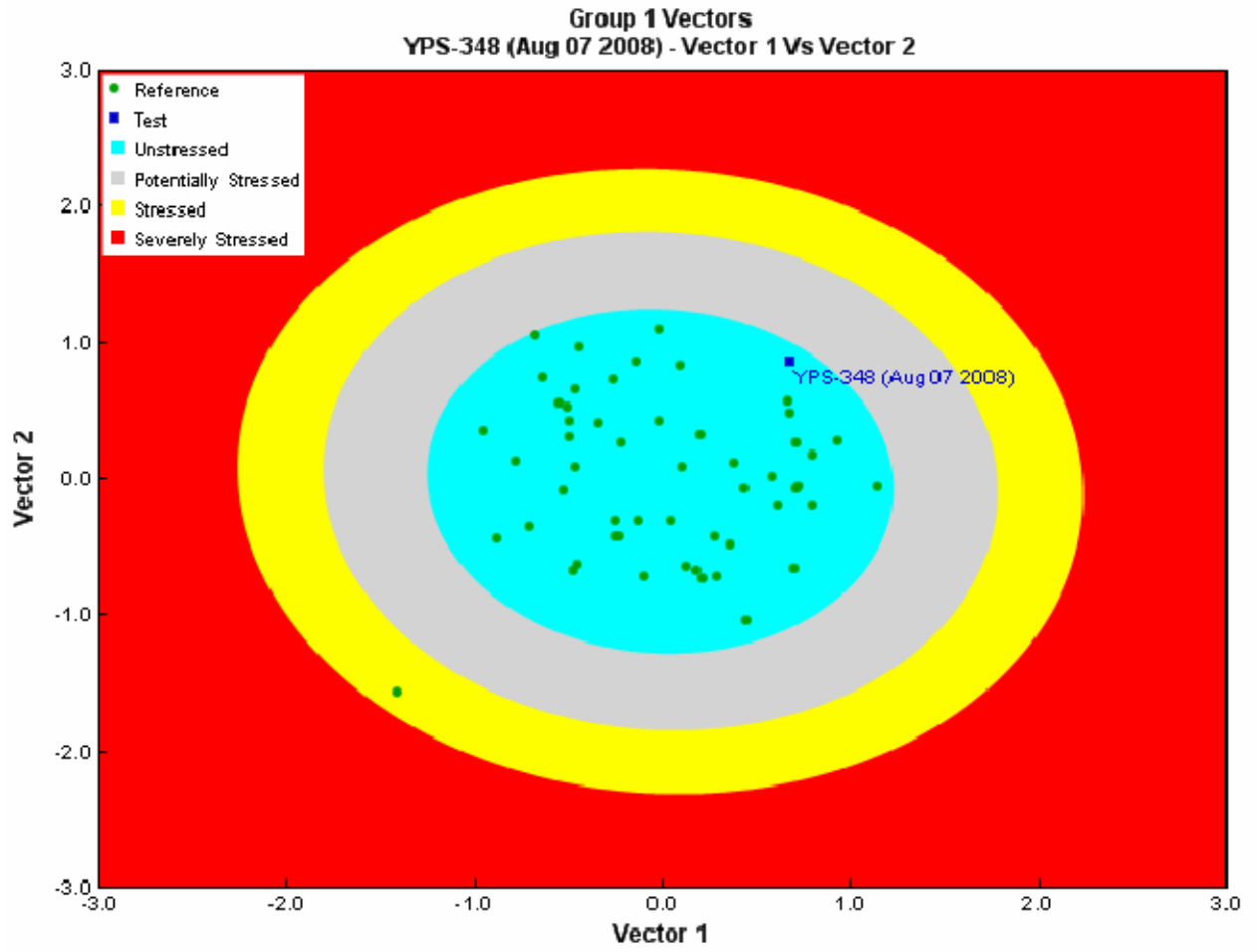
**Bray-Curtis Analysis**

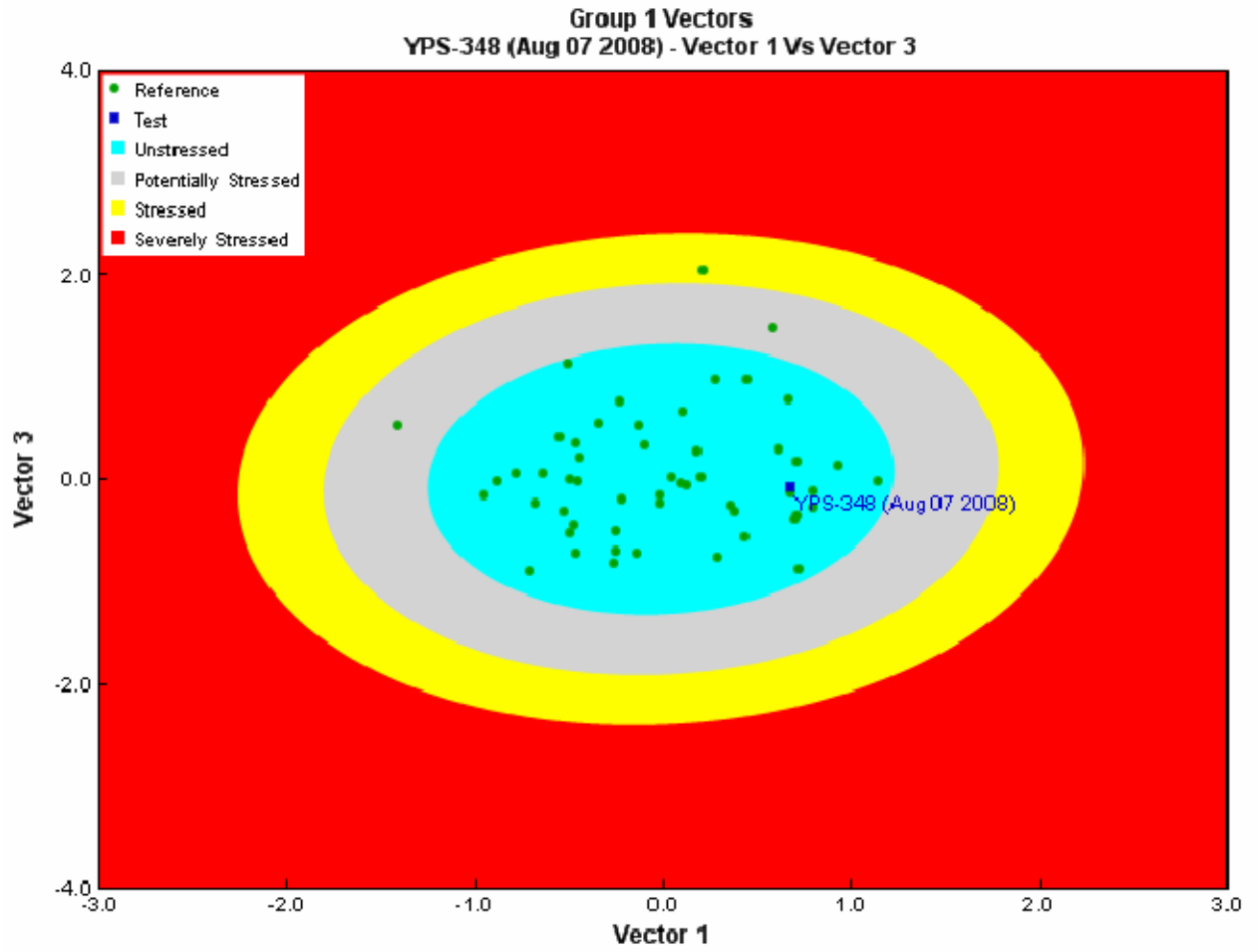
| Description                  | Value |
|------------------------------|-------|
| Bray-Curtis Distance         | 0.61  |
| Bray Curtis Reference Median | 429.5 |

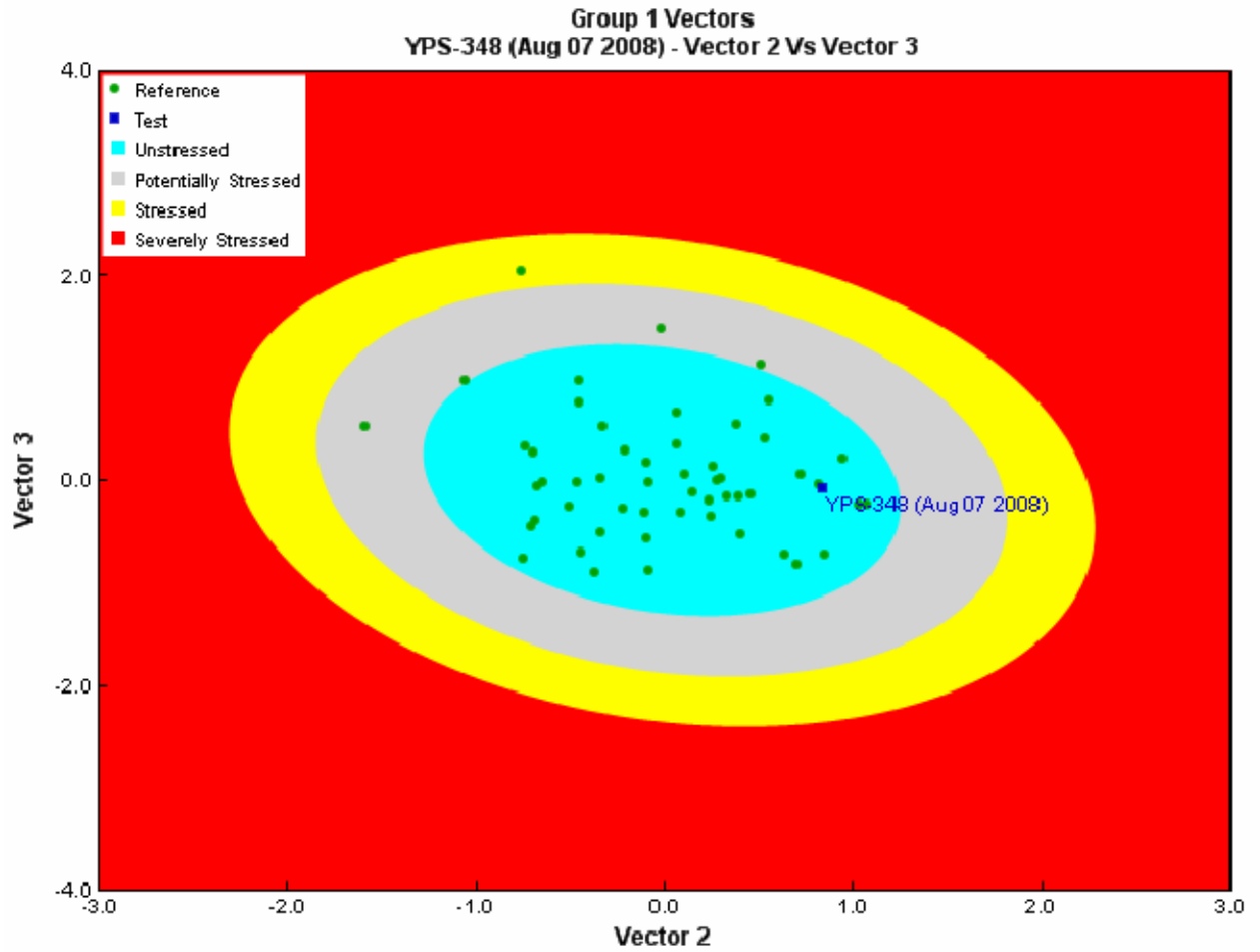
**RIVPACS Analysis**

| Taxa            | Probability of Occurrence | 2008 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    | 0.98                      | 84                   | 38.2   | 31.8   | 6                                   | Insensitive |
| Baetidae        | 0.78                      | 328                  | 46.8   | 58.2   | 4                                   | Insensitive |
| Simuliidae      | 0.75                      | 2                    | 26.7   | 44.5   | 6                                   | Insensitive |
| Nemouridae      | 0.7                       | 16                   | 19.9   | 31.8   | 2                                   | Sensitive   |
| Heptageniidae   | 0.6                       | 33                   | 39.2   | 53.4   | 4                                   | Insensitive |
| Limnephilidae   | 0.46                      | 0                    | 2.8  | 6.1  | 4                                   | Insensitive |
| Sperchonidae    | 0.42                      | 16                   | 1.9  | 3.3  | 8                                   | Tolerant    |
| Tipulidae       | 0.42                      | 2                    | 1.5  | 2.8  | 3                                   | Insensitive |
| Empididae       | 0.41                      | 12                   | 2.2  | 5.6  | 6                                   | Insensitive |
| Chloroperlidae  | 0.38                      | 12                   | 4.0  | 6.4  | 1                                   | Sensitive   |
| Naididae        | 0.37                      | 33                   | 5.6  | 12.8   | 10                                  | Tolerant    |
| Ephemerellidae  | 0.36                      | 63                   | 6.4  | 14.9   | 1                                   | Sensitive   |
| Ameletidae      | 0.3                       | 12                   | 2.6  | 7.1  | 0                                   | Sensitive   |
| Rhyacophilidae  | 0.28                      | 5                    | 2.2  | 5.1  | 0                                   | Sensitive   |
| Lumbriculidae   | 0.25                      | 0                    | 1.2  | 3.3  | 8                                   | Tolerant    |
| Perlodidae      | 0.25                      | 0                    | 0.9  | 1.9  | 2                                   | Sensitive   |
| Ceratopogonidae | 0.23                      | 9                    | 2.4  | 7.9  | 6                                   | Insensitive |
| Capniidae       | 0.2                       | 26                   | 2.6  | 7.8  | 1                                   | Sensitive   |
| Lebertiidae     | 0.19                      | 0                    | 0.7  | 2.1  | 8                                   | Tolerant    |
| Psychodidae     | 0.17                      | 14                   | 0.7  | 3.2  | 10                                  | Tolerant    |
| Dytiscidae      | 0.13                      | 0                    | 0.2  | 0.7  | 5                                   | Insensitive |
| Glossosomatidae | 0.13                      | 9                    | 1.7  | 6.9  | 0                                   | Sensitive   |
| Brachycentridae | 0.11                      | 2                    | 0.2  | 0.8  | 1                                   | Sensitive   |

**Site Assessment Graphs**







**Site Assessment Vector Data**

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

**Site Metrics**

| Metric Name       | Test Site | Reference Group Mean | Standard Deviation | Sample Size |
|-------------------|-----------|----------------------|--------------------|-------------|
| Total Abundance   | 697.48    | 226.1                |                    |             |
| Total No. of Taxa | 21.0      | 10.4                 | 4.1                | 53          |

## Site Assessment Report

### Site Metadata

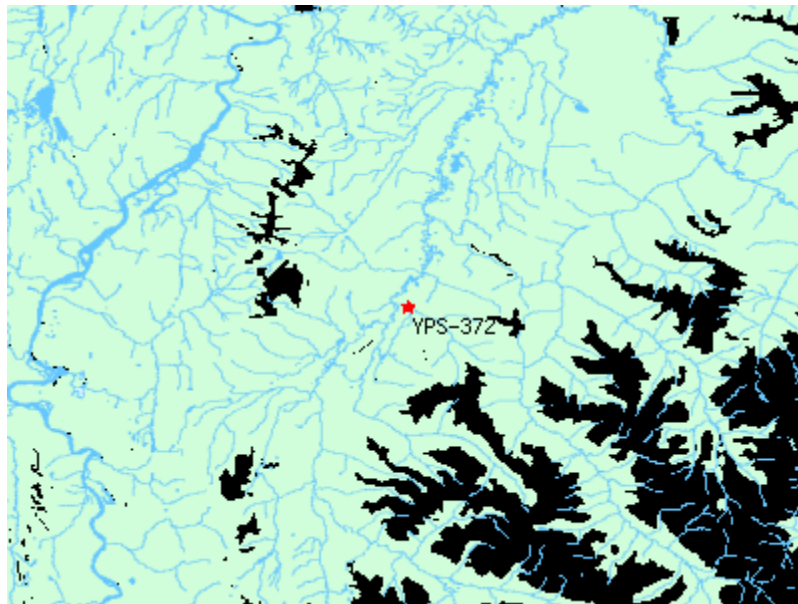
|              |                 |
|--------------|-----------------|
| Site         | YPS-372         |
| Sample Date  | Jul 30 2008     |
| Latitude     | N 61° 23' 37"   |
| Longitude    | W 134° 22' 14"  |
| Altitude     |                 |
| Feature Name | Cottoneva Creek |
| Stream Order | 3               |

### Site Photograph

*Up Stream*



### Context Map



### BEAST Prediction Results

|                        |  |      |      |       |
|------------------------|--|------|------|-------|
| Predictor Variables    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |      |      |       |
| Predicted Group Number | 4  |      |      |       |
| Group                  | 1  | 2    | 3    | 4     |
| Probability            | 1.0%   | 3.8% | 1.7% | 93.5% |

**Habitat Attributes**

| Variable   | Site  | Reference Group Mean | Standard Deviation | Sample Size |
|--|-------|----------------------|--------------------|-------------|
| Canopy - % coverage (PercentRange)                     | 3     | 1.516129             | 1.179575           | 31          |
| Channel Depth - avg (cm)                               | 15.7  | 26.74793             | 19.12511           | 29          |
| General - pH (pH)                                      | 8.1   | 7.81025              | 0.629475           | 40          |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 267   | 251.6188             | 183.3222           | 32          |
| General - Turbidity (NTU)                              | 10    | 1.467333             | 3.130127           | 15          |
| Landcover – Alpine (%)                                 | 15.7  | 0.311484             | 0.321628           | 40          |
| Landcover – Lake (%)                                   | 0     | 0.006318             | 0.022385           | 40          |
| Nitrogen - nitrate + nitrite (mg/L)                    | 0.03  | 0.0019               |                    | 1           |
| Precip Rainfall JUN (mm) (mm)                          | 33.7  | 42.56                | 8.344591           | 40          |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 114.8 | 123.515              | 13.76934           | 40          |
| Solids - total suspended (TSS) (mg/L)                  | 9.625 | 5.9704               | 6.025369           | 25          |
| Substrate - embeddedness category (Category(1-5))      | 4     | 3.870968             | 0.884757           | 31          |
| Temperature - lake surface or stream (Degrees Celsius) | 6.96  | 8.175897             | 3.335357           | 39          |
| Velocity (Avg) (m/s)                                   | 0.69  | 0.50987              | 0.879644           | 40          |
| Width - Wetted (m)                                     | 2.8   | 5.6435               | 4.464378           | 40          |
| Width - Wetted (m)                                     | 3     | 1.516129             | 1.179575           | 31          |

**Bray-Curtis Analysis**

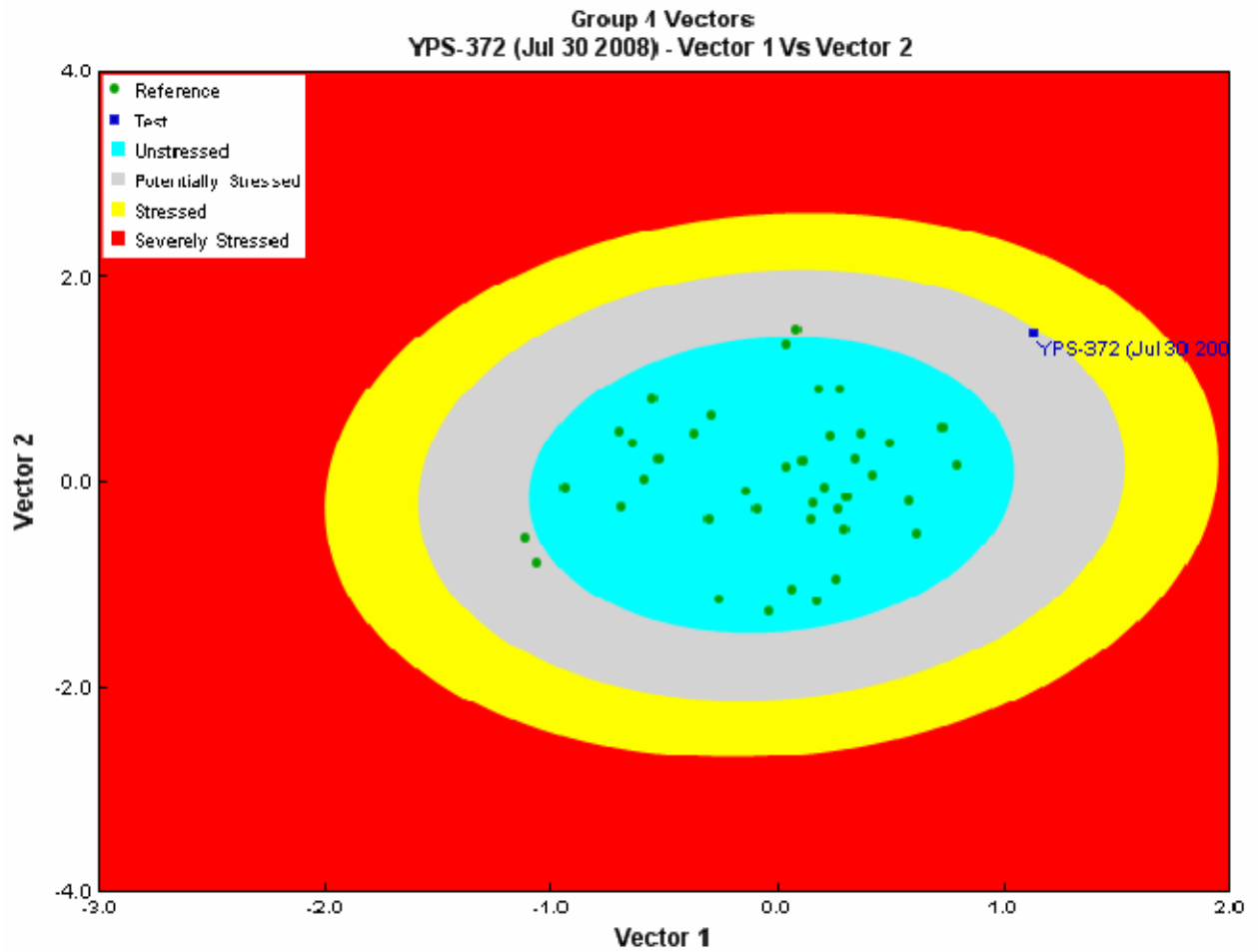
| Description                  | Value   |
|------------------------------|---------|
| Bray-Curtis Distance         | 0.84    |
| Bray Curtis Reference Median | 3038.12 |

**RIVPACS Analysis**

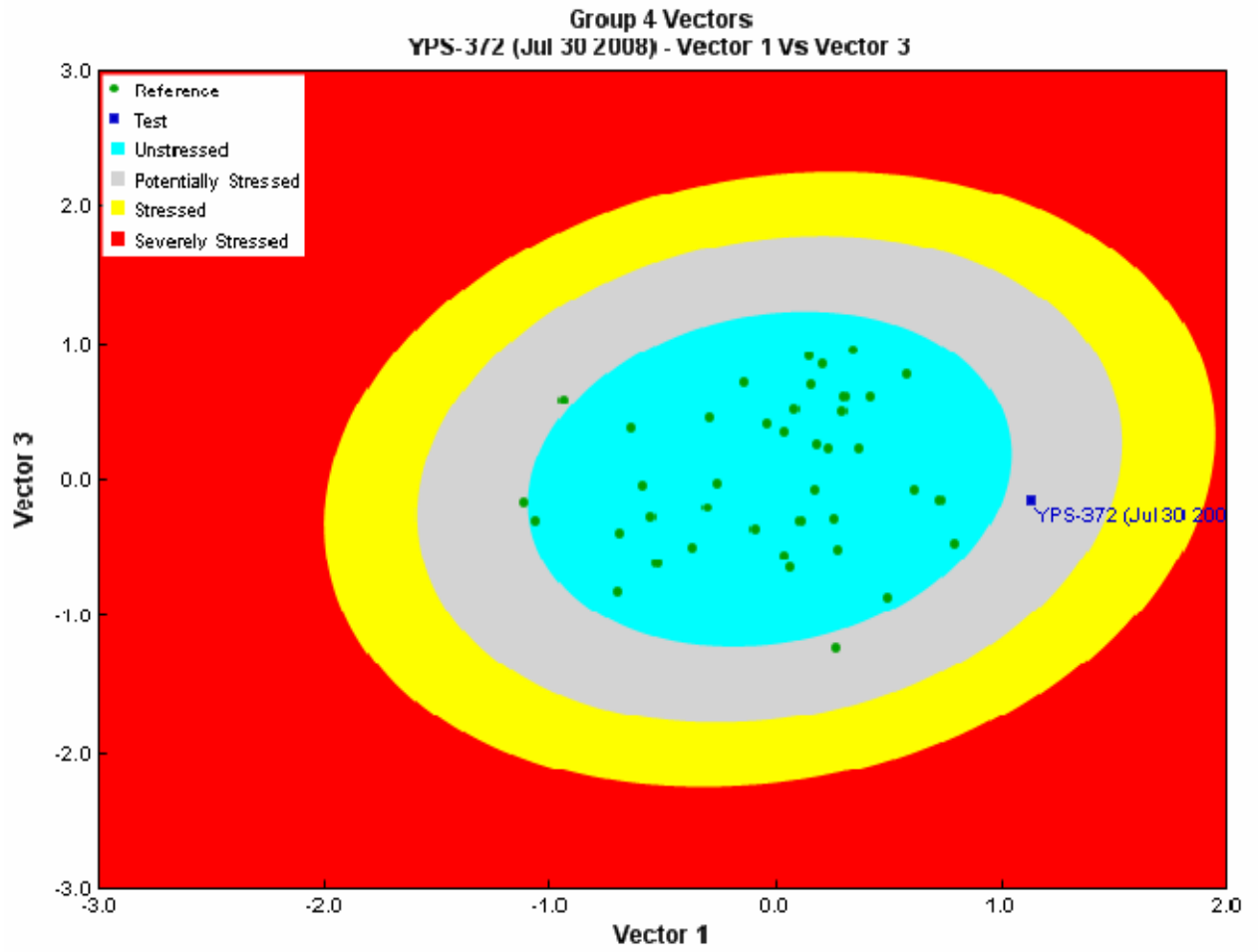
| Taxa          | Probability of Occurrence | 2008 Total Abundance | Mean of Abundance for Reference sites in Group 4 | SD of Abundance for Reference sites in Group 4 | Benthic Invertebrate Taxa Tolerance |             |
|---------------|---------------------------|----------------------|--|--|-------------------------------------|-------------|
| Chironomidae  | 1                         | 23                   | 705.6  | 949.0  | 6                                   | Insensitive |
| Baetidae      | 0.88                      | 32                   | 531.9  | 1178.0   | 4                                   | Insensitive |
| Simuliidae    | 0.88                      | -                    | 197.5  | 362.0  | 6                                   | Insensitive |
| Nemouridae    | 0.76                      | 14                   | 158.4  | 274.1  | 2                                   | Sensitive   |
| Heptageniidae | 0.68                      | 40                   | 92.7   | 122.0  | 4                                   | Insensitive |
| Empididae     | 0.58                      | -                    | 7.9  | 21.3   | 6                                   | Insensitive |
| Tipulidae     | 0.52                      | 1                    | 9.1  | 24.9   | 3                                   | Insensitive |
| Capniidae     | 0.46                      | 4                    | 43.7   | 155.1  | 1                                   | Sensitive   |
| Limnephilidae | 0.4                       | -                    | 20.6   | 59.5   | 4                                   | Insensitive |
| Sperchonidae  | 0.38                      | -                    | 17.8   | 58.3   | 8                                   | Tolerant    |
| Ameletidae    | 0.37                      | 3                    | 24.4   | 68.3   | 0                                   | Sensitive   |
| Lebertiidae   | 0.34                      | -                    | 10.9   | 26.6   | 8                                   | Tolerant    |
| Perlodidae    | 0.32                      | 1                    | 11.6   | 44.0   | 2                                   | Sensitive   |

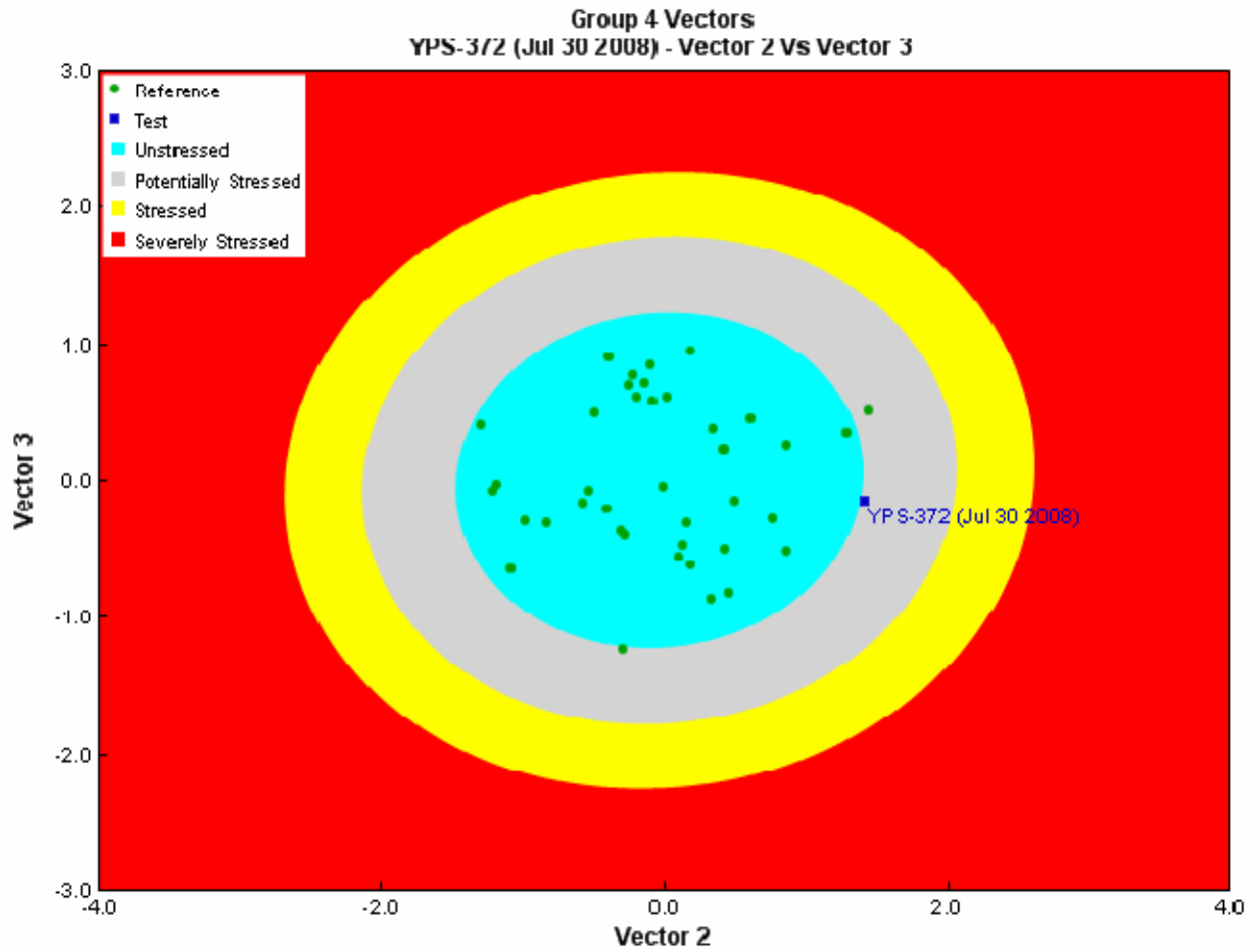
|                |      |   |      |       |    |           |
|----------------|------|---|------|-------|----|-----------|
| Chloroperlidae | 0.3  | - | 36.8 | 102.2 | 1  | Sensitive |
| Lumbriculidae  | 0.28 | - | 34.4 | 92.6  | 8  | Tolerant  |
| Psychodidae    | 0.25 | 2 | 4.8  | 15.2  | 10 | Tolerant  |
| EphemereIIDae  | 0.23 | 1 | 16.8 | 49.3  | 1  | Sensitive |
| Rhyacophilidae | 0.18 | 1 | 4.5  | 17.7  | 0  | Sensitive |

**Site Assessment Graphs**









**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         | Potentially Stressed |
| Overall                      | Potentially Stressed |

**Site Metrics**

| Metric Name       | Test Site | Reference Group Mean | Standard Deviation | Sample Size |
|-------------------|-----------|----------------------|--------------------|-------------|
| Total Abundance   | 123.0     | 2053.1               |                    |             |
| Total No. of Taxa | 12.0      | 10.4                 | 3.5                | 40          |

# Site Assessment Report

## Site Metadata

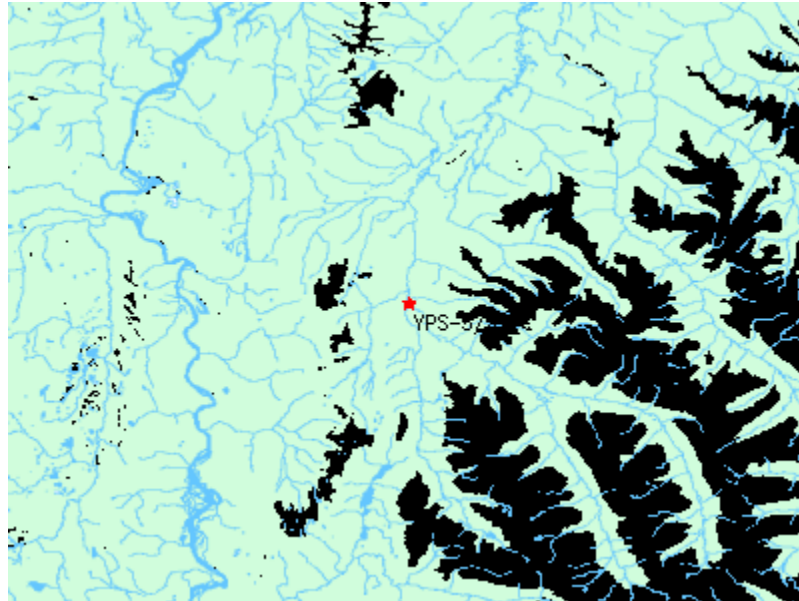
|              |                        |
|--------------|------------------------|
| Site         | YPS-373                |
| Sample Date  | Jul 30 2008            |
| Latitude     | N 61° 16' 32"          |
| Longitude    | W 134° 18' 18"         |
| Altitude     |                        |
| Feature Name | South Big Salmon River |
| Stream Order | 4                      |

## Site Photograph

*Up Stream*



## Context Map



## BEAST Prediction Results

|                        |  |       |       |       |
|------------------------|--|-------|-------|-------|
| Predictor Variables    | Channel Depth - avg,ecoregion,Landcover – Alpine,Landcover – Lake,Longitude,Precip Rainfall JUN (mm),Precip Snowfall Total ANNUAL (mm) |       |       |       |
| Predicted Group Number | 1  |       |       |       |
| Group                  | 1  | 2     | 3     | 4     |
| Probability            | 48.3%  | 13.8% | 17.9% | 20.1% |

**Habitat Attributes**

| Variable   | Site  | Reference Group Mean | Standard Deviation | Sample Size |
|--|-------|----------------------|--------------------|-------------|
| Canopy - % coverage (PercentRange)                     | 1     | 1.42                 | 0.79               | 12.00       |
| Channel Depth - avg (cm)                               | 44    | 35.59                | 21.62              | 11.00       |
| General - pH (pH)                                      | 7.6   | 7.80                 | 0.59               | 53.00       |
| General - Specific Conductance (@ 25 C) (uS/cm)        | 66    | 181.85               | 116.15             | 51.00       |
| General - Turbidity (NTU)                              | 1     | 0.41                 | #DIV/0!            | 1.00        |
| Landcover – Alpine (%)                                 | 66.7  | 0.28                 | 0.28               | 53.00       |
| Landcover – Lake (%)                                   | 0.1   | 0.01                 | 0.03               | 53.00       |
| Nitrogen - nitrate + nitrite (mg/L)                    | 0.02  | 0.06                 |                    | 37.00       |
| Precip Rainfall JUN (mm) (mm)                          | 30.5  | 33.40                | 6.07               | 53.00       |
| Precip Snowfall Total ANNUAL (mm) (mm)                 | 144.6 | 138.76               | 23.56              | 53.00       |
| Solids - total suspended (TSS) (mg/L)                  | 0.875 | 9.19                 | 13.46              | 42.00       |
| Substrate - embeddedness category (Category(1-5))      | 4     | 3.67                 | 1.07               | 12.00       |
| Temperature - lake surface or stream (Degrees Celsius) | 6.42  | 9.95                 | 3.66               | 53.00       |
| Velocity (Avg) (m/s)                                   | 0.86  | 0.51                 | 0.31               | 53.00       |
| Width - Wetted (m)                                     | 18.8  | 5.86                 | 4.96               | 53.00       |

**Bray-Curtis Analysis**

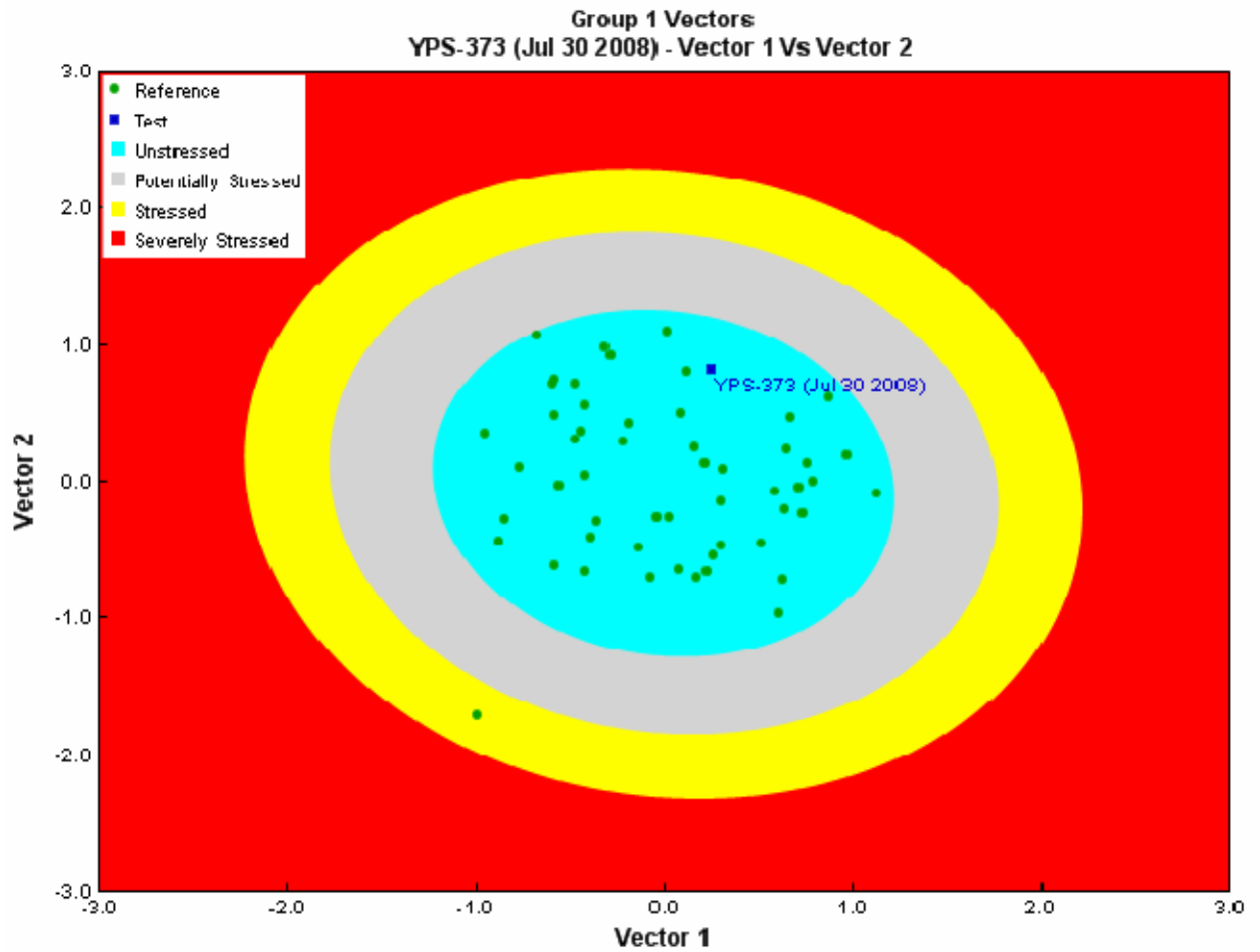
| Description                  | Value |
|------------------------------|-------|
| Bray-Curtis Distance         | 0.85  |
| Bray Curtis Reference Median | 429.5 |

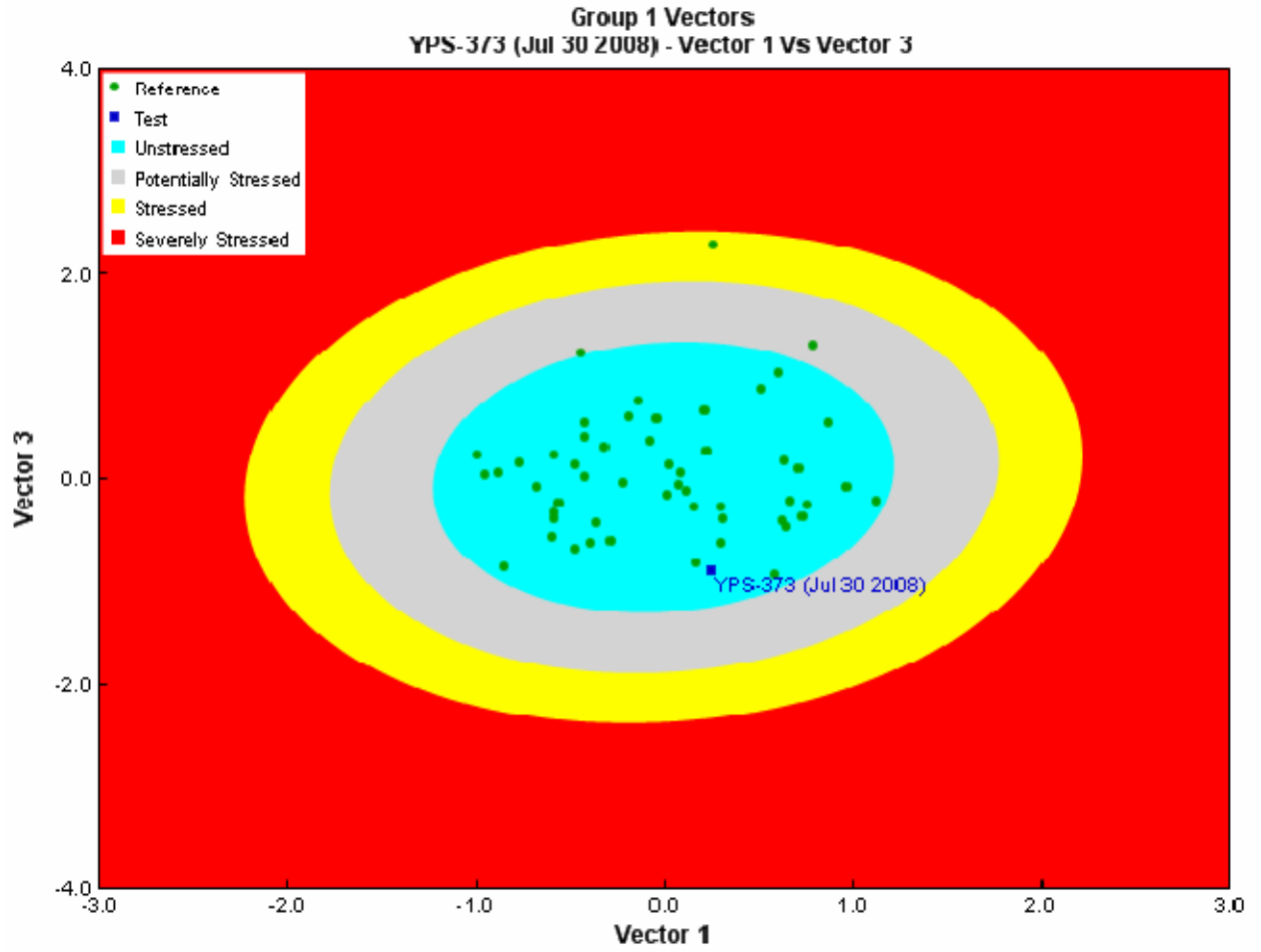
**RIVPACS Analysis**

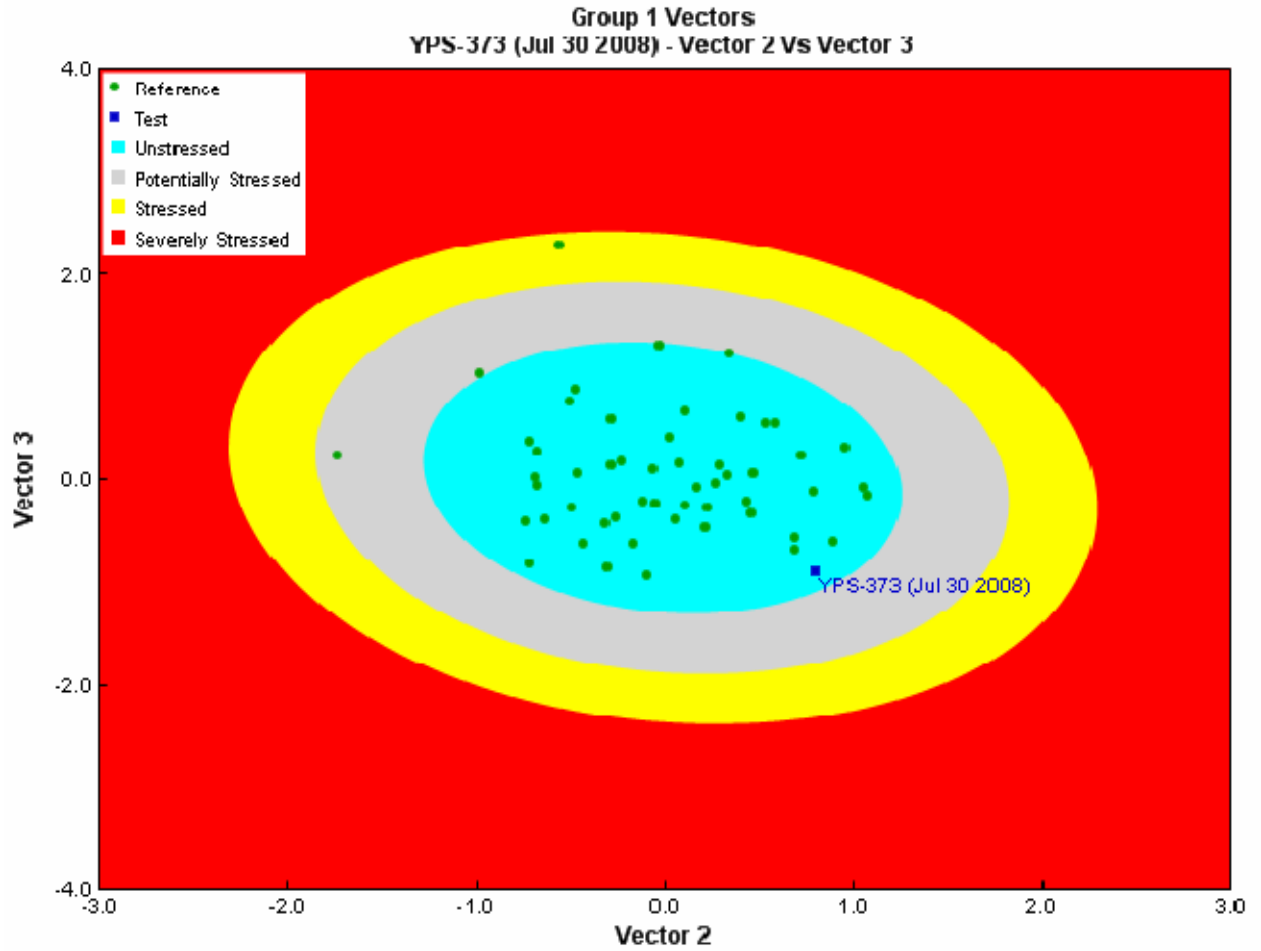
| Taxa           | Probability of Occurrence | 2008 Total Abundance | Mean of Abundance for Reference sites in Group 1 | SD of Abundance for Reference sites in Group 1 | Benthic Invertebrate Taxa Tolerance |             |
|----------------|---------------------------|----------------------|--|--|-------------------------------------|-------------|
| Chironomidae   | 0.98                      | 174                  | 38.2   | 31.8   | 6                                   | Insensitive |
| Baetidae       | 0.76                      | 150                  | 46.8   | 58.2   | 4                                   | Insensitive |
| Simuliidae     | 0.75                      | 13                   | 26.7   | 44.5   | 6                                   | Insensitive |
| Nemouridae     | 0.7                       | 74                   | 19.9   | 31.8   | 2                                   | Sensitive   |
| Heptageniidae  | 0.6                       | 366                  | 39.2   | 53.4   | 4                                   | Insensitive |
| Limnephilidae  | 0.42                      | 0                    | 2.8  | 6.1  | 4                                   | Insensitive |
| Tipulidae      | 0.42                      | 0                    | 1.5  | 2.8  | 3                                   | Insensitive |
| Empididae      | 0.41                      | 0                    | 2.2  | 5.6  | 6                                   | Insensitive |
| Sperchonidae   | 0.38                      | 5                    | 1.9  | 3.3  | 8                                   | Tolerant    |
| Chloroperlidae | 0.37                      | 16                   | 4.0  | 6.4  | 1                                   | Sensitive   |
| Ephemerellidae | 0.35                      | 189                  | 6.4  | 14.9   | 1                                   | Sensitive   |
| Naididae       | 0.34                      | 42                   | 5.6  | 12.8   | 10                                  | Tolerant    |
| Ameletidae     | 0.29                      | 5                    | 2.6  | 7.1  | 0                                   | Sensitive   |

|                 |      |    |     |     |   |             |
|-----------------|------|----|-----|-----|---|-------------|
| Perlodidae      | 0.25 | 13 | 0.9 | 1.9 | 2 | Sensitive   |
| Rhyacophilidae  | 0.25 | 8  | 2.2 | 5.1 | 0 | Sensitive   |
| Capniidae       | 0.24 | 16 | 2.6 | 7.8 | 1 | Sensitive   |
| Lumbriculidae   | 0.24 | 0  | 1.2 | 3.3 | 8 | Tolerant    |
| Ceratopogonidae | 0.22 | 0  | 2.4 | 7.9 | 6 | Insensitive |

Site Assessment Graphs







**Site Assessment Vector Data**

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

**Site Metrics**

| Metric Name       | Test Site | Reference Group Mean | Standard Deviation | Sample Size |
|-------------------|-----------|----------------------|--------------------|-------------|
| Total Abundance   | 1078.81   | 226.1                |                    |             |
| Total No. of Taxa | 16.0      | 11.4                 | 4.1                | 53          |