Environmental
Transportation
Land Development
Services

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Memorandum

To: Sugarbush – WQRP File

Date: March 24, 2010

Project No: 57017.02

From: Lynse B. Stafford and Meddie J. Perry

Re: Rice Brook and Clay Brook Biomonitoring Data: 303(d) De-Listing Request

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This memorandum provides a summary of the aquatic biota sampling conducted by VHB Pioneer within the Rice Brook watershed and the Clay Brook watershed. Both watersheds are in the vicinity of Sugarbush Resort (Sugarbush).

Aquatic biota sampling has been conducted during 1995 and 1997 through 2009 in Rice Brook at stations BU-5, BU-1A, BU-1B, BD-2, and BD-3, as shown on the Biomonitoring Stations Map on page 1 of Attachment 1. On Clay Brook, biomonitoring has been conducted at stations "iron-up" and "iron-down" between 2005 and 2008, and at stations BIO 2.0 and BIO 2.1 in 2006 through 2009 for the Lincoln Peak Wastewater Indirect Discharge Permit (IDP). Kick net data from these sites are evaluated in this memorandum. Artificial substrate biomonitoring results for compliance with the Indirect Discharge Permits have been reported separately.

All aquatic biota sampling and data analysis were conducted following Vermont Department of Environmental Conservation (VTDEC) protocols[1]. At each station monitored in 2009, duplicate kick net samples were collected at each station (for sites BIO 2.0, BIO 2.1, BU-1B, and BD-2 that are IDP compliance stations, VHB Pioneer analyzed one sample and provided the replicate to the VTDEC for analysis. At the other stations, VHB Pioneer analyzed both sample replicates).

A summary of the major aquatic biota metrics at each monitoring station is provided below. Results from Clay Brook indicate improved biologic indicators of water quality, but continued efforts to improve stormwater management and further monitoring are warranted. In Rice Brook, the results show a consistent improvement in biometrics and biological integrity, and therefore, we recommend de-listing Rice Brook from the 303(d) list.

Biomonitoring Stations Description

On Rice Brook, station BU-5, the most upstream station at an approximate elevation of 1,825 feet, is located above the former snowmaking pump station. At an approximate elevation of 1,500 feet, station BU-1A is located above the confluence of Rice Brook and Hotel Brook near the parking lot sedimentation basin. Station BU-1B is located below the confluence of Rice Brook and Hotel Brook, but above the Mountain Wastewater Treatment (MWT) leachfield at an

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[1] Vermont DEC, 2006. Water Quality Division Field Methods Manual. April, 2006.
Vermont DEC, 2004. Biocriteria for Fish and Macroinvertebrate Assemblages in Vermont Wadeable Streams and Rivers: Implementation Phase. February 10, 2004.

approximate elevation of 1,475 feet, and is the upstream station for the MWT IDP (#9-0013). Station BD-2 is located at an approximate elevation of 1,450 feet on Rice Brook below the MWT leachfield and the Sugarbush Access Road culvert, and is the downstream compliance station for the MWT IDP. Station BD-3 is located above the confluence of Rice Brook and Clay Brook (approximate elevation of 1,375 feet); at a location approximately 1,000 feet downstream of Sugarbush's land holdings. See the Biomonitoring Stations Map, page 1 of Attachment 1.

Station BIO 2.1 is located on Clay Brook at an elevation of approximately 1,500 feet, and is the upstream monitoring station for the Lincoln Peak IDP (#9-0260). Station BIO 2.0 is located at an elevation of approximately 1,400 feet, and it is the downstream compliance monitoring station for the Lincoln Peak IDP. See the Biomonitoring Stations Map located on page 1 of Attachment 1.

Rice Brook Station BU-5

The upstream-most station that is located above the Sugarbush base area development, station BU-5 met Class B2-3 biocriteria in four (2001, 2005, 2008, and 2009) of the twelve years of monitoring, including the most recent two consecutive years. This station represents ambient, or background conditions at Sugarbush, and may be affected by regional factors such as acid rain, but is otherwise a natural undisturbed stream. Historically, the metrics that have not met Class B2-3 thresholds were Density, Richness, EPT, and % PPCS-FG. Kick net field sheets, raw macroinvertebrate kick net results, summary tables, Class B2-3 biocriteria outcome sheets, and graphs for station BU-5 are provided on pages 2 through 14 of Attachment 1, and are summarized in Table 1.

Table 1: Rice Brook - Station BU-5 Biocriteria Compliance Summary Upstream of Sugarbush Base Area/Development

Year	Density	Richness	EPT	% PMA -O	BI	% Oligo.	EPT/ EPT+ C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥40	
1995	**135**	**21.5**	**12.5**	59.0	1.61	0.00	0.790	**32.0**	Biocriteria Not Met
1997	**217**	**23.5**	**12.5**	72.0	1.31	0.50	0.820	42.0	Biocriteria Not Met
2000	375	**25.0**	**13.0**	63.1	1.67	0.90	0.800	42.0	Biocriteria Not Met
2001	382	29.5	17.5	54.8	1.74	0.80	0.680	40.0	Biocriteria Met
2002	**284**	**26.0**	**12.5**	56.8	2.22	0.50	0.640	**37.0**	Biocriteria Not Met

Table 1: Rice Brook - Station BU-5 Biocriteria Compliance Summary Upstream of Sugarbush Base Area/Development

Year	Density	Richness	EPT	% PMA -O	BI	% Oligo.	EPT/ EPT+ C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥40	
2003	1323	34.0	18.5	61.1	2.00	3.00	0.860	**37.0**	Indeterminate
2004	575	31.5	18.0	62.8	1.83	2.10	0.800	**38.0**	Indeterminate
2005	650	30.5	17.5	62.4	1.69	3.30	0.790	41.0	Biocriteria Met
2006	**277**	28.0	16.0	63.0	2.13	1.90	0.690	41.0	Indeterminate
2007	515	**22.0**	**14.0**	67.7	1.31	1.59	0.949	51.7	Biocriteria Not Met
2008	493	28.5	19.0	63.6	0.91	1.87	0.907	47.0	Biocriteria Met
2009	689	32.5	19.0	60.7	1.34	1.74	0.911	47.6	Biocriteria Met

Bold/shading denotes metric did not meet Class B2-3 biocriteria threshold

The Density metric varied considerably, but showed no overall trend from 1995 to 2009. However, eight years (2000, 2001, 2003 to 2005, and 2007 to 2009) during this twelve-year monitoring period the ANR Class B2-3 criteria for Density has been met.

The Richness metric results have ranged between 21.5 and 34.0 during the twelve years of monitoring. BU-5 met the Class B2-3 criteria during 2008 and 2009 for Richness. The EPT metric also met the Class B2-3 threshold for 2008 and 2009, and has noticeably improved since monitoring during 1995. The % PMA-O, Biotic Index, % Oligochaeta, and EPT/EPT+C indices have consistently met the criteria during all years of monitoring. The % PPCS-FG metric, which measures the composition of the feeding group in the sample stream against the composition of a model "reference" stream, has been above the Class B2-3 threshold during the past five years of the study period.

Rice Brook Station BU-1A

Station BU-1A is downstream from portions of the Lincoln Peak base area and the Sugarbush Village. This station has met Class B2-3 biocriteria during five (2003 to 2005, 2008, and 2009) of the past twelve years, including the most recent two consecutive years. During seven of the earlier years of monitoring, the station had not met Class B2-3 biocriteria due to low Richness and EPT metrics. Kick net field sheets, raw macroinvertebrate kick net results, summary tables,

Class B2-3 biocriteria outcome sheets, and graphs for station BU-1A are provided on pages 15 through 27 of Attachment 1, and are summarized in Table 2.

Table 2: Rice Brook - Station BU-1A Biocriteria Compliance Summary
Above confluence of Rice Brook & Hotel Brook

Year	Density	Richness	EPT	% PMA -O	BI	% Oligo.	EPT/ EPT+ C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥40	
1995	**148**	**18.0**	**10.0**	64.0	1.82	0.00	0.860	44.0	Biocriteria Not Met
1997	**207**	**22.0**	**11.5**	75.0	1.61	2.00	0.880	**37.0**	Biocriteria Not Met
2000	**279**	**18.0**	**9.00**	48.7	1.21	1.70	0.940	**31.0**	Biocriteria Not Met
2001	**276**	30.0	**15.5**	70.7	1.96	2.70	0.770	46.0	Indeterminate
2002	349	**24.5**	**12.0**	56.5	2.49	1.00	0.540	46.0	Biocriteria Not Met
2003	903	28.5	16.5	73.1	1.98	1.40	0.820	46.0	Biocriteria Met
2004	466	31.0	16.5	75.9	2.44	4.30	0.810	45.0	Biocriteria Met
2005	576	29.0	16.5	66.4	2.16	2.90	0.680	46.0	Biocriteria Met
2006	477	**26.5**	**13.5**	78.5	2.74	0.90	0.750	43.0	Biocriteria Not Met
2007	505	**21.5**	**14.0**	75.7	1.47	0.61	0.900	45.0	Biocriteria Not Met
2008	379	30.0	16.5	70.6	1.95	1.72	0.718	70.5	Biocriteria Met
2009	370	32.5	19.0	64.5	1.60	3.83	0.836	52.6	Biocriteria Met

Bold/shading denotes metric did not meet Class B2-3 biocriteria threshold

The station met Class B2-3 biocriteria in 2008 and 2009. The Density metric shows a slight decrease from past years but continues to meet threshold levels. Richness and EPT metrics did

meet thresholds in 2008 and 2009; both metrics have shown improvement since 2007. The % PMA-O, Biotic Index, % Oligochaeta, and EPT/EPT+C indices have consistently met the criteria during all years of monitoring. The % PPCS-FG metric, which measures the composition of the feeding group in the sample stream against the composition of a model "reference" stream, has been above the Class B2-3 threshold for ten of the twelve years of the study period.

Rice Brook Station BU-1B

In 2009, station BU-1B met the Class B2-3 biocriteria for the fifth time in 14 years, representing four consecutive years of meeting the criteria. The recent results suggest a consistent improvement in the aquatic biota at this station. Kick net field sheets, raw macroinvertebrate kick net results, summary tables, Class B2-3 biocriteria outcome sheets, and graphs for station BU-1B are provided on pages 28 through 39 of Attachment 1, and are summarized in Table 3.

Density levels have improved significantly from the low results observed from 1995 and 1997 through 2002. Richness and EPT metrics having met their respective Class B2-3 criteria in 2006 through 2009, following several years of not meeting the criteria, suggests that the habitat conditions have been improved. It is likely that completion of stormwater management improvements in the Lincoln Peak base area, along with the completion of segments of the Hotel Brook channel restoration project have improved the hydrologic and sediment transport regimes within Rice Brook and that density levels will continue to indicate compliance. The % PMA-O, Biotic Index, % Oligochaeta, and EPT/EPT+C indices have consistently met the criteria during all years of monitoring. The % PPCS-FG metric, which measures the composition of the feeding group in the sample stream against the composition of a model "reference" stream, has been above the Class B2-3 threshold during the past nine years of the study period.

Table 3: Rice Brook - Station BU-1B Biocriteria Compliance Summary Below confluence of Rice Brook and Hotel Brook

Year	Density	Richness	EPT	% PMA -O	BI	% Oligo.	EPT/ EPT+ C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥40	
1995	**259**	**24.0**	**15.0**	68.0	2.21	1.50	0.690	57.0	Biocriteria Not Met
1997	**178**	**24.0**	**14.0**	86.0	1.71	2.80	0.870	48.0	Biocriteria Not Met
1998	**125**	**22.0**	**13.0**	68.0	3.19	8.80	0.580	**37.0**	Biocriteria Not Met
1999	**249**	**26.3**	**15.0**	60.0	2.12	3.30	0.730	55.0	Biocriteria Not Met
2000	**218**	**21.0**	**12.0**	49.9	0.90	1.80	0.900	**37.0**	Biocriteria Not Met

Table 3: Rice Brook - Station BU-1B Biocriteria Compliance Summary Below confluence of Rice Brook and Hotel Brook

Year	Density	Richness	EPT	% PMA -O	BI	% Oligo.	EPT/ EPT+ C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥40	
2001	**243**	**25.0**	**12.0**	63.0	2.25	0.00	0.610	54.0	Biocriteria Not Met
2002	**261**	**23.0**	**12.0**	58.0	2.81	0.00	0.500	52.0	Biocriteria Not Met
2003	609	**20.0**	**12.0**	65.3	1.09	1.50	0.890	45.0	Biocriteria Not Met
2004	393	35.0	17.0	79.4	2.22	6.40	0.751	53.0	Biocriteria Met
2005	362	29.0	**14.5**	60.9	2.51	1.00	0.640	48.0	Biocriteria Not Met
2006	302	31.0	17.0	73.7	2.20	0.99	0.765	47.0	Biocriteria Met
2007	332	28.0	16.0	84.4	2.37	0.60	0.856	57.2	Biocriteria Met
2008	395	35.0	21.0	87.2	2.85	1.01	0.728	71.0	Biocriteria Met
2009	362	37.0	21.0	63.9	1.90	3.59	0.731	48.3	Biocriteria Met

Bold/shading denotes metric did not meet Class B2-3 biocriteria threshold

Rice Brook Station BD-2

An overall assessment of aquatic biota metrics suggests a general improvement in biological diversity at station BD-2. Specifically, four of the last six years at this station have met Class B2-3 biocriteria. In two of the past three years, the results met the criteria whereas the third year (2008) scored as indeterminate due to a density result that was only slightly below the threshold level. The 2009 results met the Class B2-3 biocriteria; this is a substantial improvement considering that data for 1995, and 1997 through 2003 did not meet the criteria at this station. Kick net field sheets, raw macroinvertebrate kick net results, summary tables, Class B2-3 biocriteria outcome sheets, and graphs for station BD-2 are provided on pages 40 through 51 of Attachment 1, and are summarized in Table 4.

Table 4: Rice Brook - Station BD-2 Biocriteria Compliance Summary Below MWT leachfield and Sugarbush Access Road culvert

Year	Density	Richness	EPT	% PMA -O	BI	% Oligo.	EPT/ EPT+ C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥40	
1995	**141**	**16.0**	**11.0**	70.0	2.05	5.00	0.810	47.0	Biocriteria Not Met
1997	**120**	**23.0**	**14.0**	71.0	1.44	**14.0**	0.870	51.0	Biocriteria Not Met
1998	**82**	**18.0**	**10.0**	63.0	3.00	3.70	0.580	**34.0**	Biocriteria Not Met
1999	**177**	**25.7**	**15.3**	63.0	2.34	3.40	0.660	51.0	Biocriteria Not Met
2000	327	**22.0**	**11.0**	50.1	0.93	0.00	0.870	46.0	Biocriteria Not Met
2001	**269**	28.0	17.0	74.0	2.22	1.10	0.680	55.0	Indeterminate
2002	**190**	**20.0**	**11.0**	61.6	2.21	1.10	0.620	66.0	Biocriteria Not Met
2003	465	27.0	**12.0**	55.3	1.73	0.60	0.740	44.0	Biocriteria Not Met
2004	522	35.0	18.0	68.6	1.55	9.00	0.843	51.0	Biocriteria Met
2005	350	34.5	17.5	59.6	2.78	4.10	0.600	61.0	Biocriteria Met
2006	**236**	29.0	18.0	75.0	2.86	2.97	0.650	43.0	Biocriteria Not Met
2007	374	35.0	17.0	65.9	1.89	2.14	0.768	51.9	Biocriteria Met
2008	**297**	32.0	20.0	68.6	2.16	5.39	0.922	42.9	Indeterminate
2009	394	29.0	20.0	69.2	1.77	0.254	0.841	47.6	Biocriteria Met

Bold/shading denotes metric did not meet Class B2-3 biocriteria threshold

Aquatic biota assessment results indicate a fluctuation in density during the 14 years of sampling. There has been a general increase in Richness and EPT metrics since 2003. The % PMA-O, Biotic Index, and EPT/EPT+C indices have consistently met the criteria during all years of monitoring. The % PPCS-FG metric, which measures the composition of the feeding group in the sample stream against the composition of a model "reference" stream, has been above the Class B2-3 threshold during the most recent eleven years of the study period. The % Oligochaeta metric, while usually meeting the Class B2-3 threshold during the 14-year study period, has shown improvement from the highest value (14.0 percent) observed in 1997, which provides evidence that sediment conditions have improved in recent years, because this order thrives in sediment-laden conditions. In 2005, the Town of Warren completed a culvert replacement project at the Sugarbush Access Road immediately upstream of station BD-2. The new culvert provides for improved sediment transport capabilities in Rice Brook, and has likely enabled the fine sands and sediments to pass downstream rather than accumulating along this segment of the brook.

Rice Brook Station BD-3

Kick net field sheets, raw macroinvertebrate kick net results, summary tables, Class B2-3 biocriteria outcome sheets, and graphs for station BD-3 are provided on pages 52 through 64 of Attachment 1, and are summarized in Table 5. An assessment of aquatic biota metrics from 1995, 1997, and 2000 through 2009 indicates that Rice Brook has generally shown improvement at Station BD-3 since 2002.

Table 5: Rice Brook - Station BD-3 Biocriteria Compliance Summary Downstream-Most Station, above confluence with Clay Brook

Year	Density	Richness	EPT	% PMA -O	BI	% Oligo.	EPT/ EPT+ C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥40	
1995	**143.5**	**22**	**11.5**	76.0	1.46	5.20	0.910	48.0	Biocriteria Not Met
1997	**140.5**	**20**	**11.5**	79.0	1.70	**19.5**	0.890	55.0	Biocriteria Not Met
2000	435	**21.0**	**10.0**	70.7	2.31	1.90	0.820	**36.0**	Biocriteria Not Met
2001	442	27.5	**14.5**	66.6	2.78	3.70	0.870	**38.0**	Biocriteria Not Met
2002	757	29.0	**15.5**	68.3	2.73	0.40	0.670	**34.0**	Biocriteria Not Met
2003	451	**26.5**	**15.5**	71.7	1.84	1.30	0.930	41.0	Indeterminate

Table 5: Rice Brook - Station BD-3 Biocriteria Compliance Summary Downstream-Most Station, above confluence with Clay Brook

Year	Density	Richness	EPT	% PMA -O	BI	% Oligo.	EPT/ EPT+ C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	**≥300**	**≥27**	**≥16**	**≥45**	**≤4.50**	**≤12**	**≥0.45**	**≥40**	
2004	362	33.0	17.5	80.2	2.02	10.6	0.920	43.0	Biocriteria Met
2005	425	29.0	**15.5**	75.5	3.06	3.70	0.880	52.0	Indeterminate
2006	702	**24.5**	16.5	62.5	3.67	1.17	0.950	**32.9**	Biocriteria Not Met
2007	572	**26.5**	18.5	76.2	3.03	0.17	0.937	54.6	Indeterminate
2008	503	29.5	16.5	76.6	2.59	0.59	0.860	53.5	Biocriteria Met
2009	419	29.0	19.0	83.7	3.23	4.59	0.892	51.1	Biocriteria Met

Bold/shading denotes metric did not meet Class B2-3 biocriteria threshold

The 2008 and 2009 results met the Class B2-3 biocriteria. Richness values remained consistent with 2008 values in comparison to 2006 and 2007 when thresholds were not met. The EPT metric has steadily been increasing 1995 and has met Class B2-3 biocriteria during five of the past six years, which suggests that habitat conditions have improved. The % PMA-O, Biotic Index, and EPT/EPT+C indices have consistently met the criteria during all years of monitoring. The % PPCS-FG metric has been above the Class B2-3 threshold during the past three years of the study period. The reduction in the % Oligochaeta value from 19.5 percent in 1997 to the low of 0.17 percent in 2007 provides additional evidence that sediment conditions have improved in recent years, because this order thrives in sediment-laden conditions.

Clay Brook Station Iron – Upstream

This station was not monitored in 2009. An assessment of aquatic biota metrics from 2005 through 2008 indicates that Clay Brook has not met the Class B2-3 biocriteria at station Iron Upstream, as summarized in Table 6.

Table 6: Clay Brook- Station Iron Upstream Biocriteria Compliance Summary

Year	Density	Richness	EPT	% PMA -O	BI	% Oligo.	EPT/EPT+C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥40	
2005	**80**	**21.5**	17.0	72.1	1.96	2.70	0.927	40.1	Biocriteria Not Met
2006	**92**	**19.5**	**10.5**	66.8	2.08	0.575	0.770	46.5	Biocriteria Not Met
2007	**121**	**22.5**	**14.0**	69.0	2.02	0.407	0.886	44.9	Biocriteria Not Met
2008	**106**	**20.5**	**11.5**	56.1	1.11	1.44	0.906	**32.0**	Biocriteria Not Met

Bold/shading denotes metric did not meet Class B2-3 biocriteria threshold

The Class B2-3 biocriteria were not met during 2008 due to low Density, Richness, EPT, and % PPCS-FG. Density has continually fluctuated since 2005 and has yet to reach Class B2-3 thresholds. Richness and EPT levels have also fluctuated over the past four years and have slightly decreased since 2007 monitoring. The % PPCS-FG metric, which measures the composition of the feeding group in the sample stream against the composition of a model "reference" stream, was below the Class B2-3 threshold during 2008 for the first time during the four-year study period.

Clay Brook Station Iron – Downstream

This station was not monitored in 2009. An assessment of aquatic biota metrics from 2005 through 2008 indicates that Clay Brook has not met the Class B2-3 biocriteria at station Iron Upstream, as summarized in Table 7.

Table 7: Clay Brook- Station Iron Downstream Biocriteria Compliance Summary

Year	Density	Richness	EPT	% PMA -O	BI	% Oligo.	EPT/EPT+C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥40	
2005	**164**	**26.5**	16.0	70.6	2.05	3.26	0.95	40.8	Biocriteria Not Met
2006	**237**	**22.5**	**12.0**	73.9	2.31	0.68	0.81	47.3	Biocriteria Not Met

Table 7: Clay Brook- Station Iron Downstream Biocriteria Compliance Summary									
Year	Density	Richness	EPT	% PMA -O	BI	% Oligo.	EPT/EPT+C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥40	
2007	**278**	**26.0**	**15.5**	78.7	1.70	1.66	0.91	62.7	Biocriteria Not Met
2008	**117**	**22.0**	**12.5**	58.1	1.31	9.10	0.92	**32.2**	Biocriteria Not Met
Bold denotes metric did not meet Class B2-3 biocriteria threshold									

The Class B2-3 biocriteria were not met due to low Density, Richness, EPT, and % PPCS-FG results during 2008. Density increased from 2005 to 2007 (164 to 278) but the lowest results to date (117) were recorded during 2008. Richness and EPT levels have fluctuated during the past four years. The % PPCS-FG metric, which measures the composition of the feeding group in the sample stream against the composition of a model "reference" stream, was below the Class B2-3 threshold in 2008 for the first time since monitoring commenced in 2005.

Clay Brook – BIO 2.1 (Upstream)

Kick net field sheets, raw macroinvertebrate kick net results, summary tables, Class B2-3 biocriteria outcome sheets, and graphs for Clay Brook station BIO 2.1 are provided on pages 1 through 12 of Attachment 2, and are summarized in Table 8.

Table 8: Clay Brook – BIO 2.1 (Upstream IDP Station) Biocriteria Compliance Summary									
Year	Density	Richness	EPT	% PMA -O	BI	% Oligo.	EPT/ EPT+ C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥40	
2006	**258**	28.0	18.0	80.0	1.58	1.16	0.909	53.0	Indeterminate
2007	310	**26.0**	19.0	90.0	1.55	0.00	0.890	70.0	Biocriteria Not Met
2008	**267**	28.0	16.0	61.5	1.26	1.87	0.944	**37.5**	Indeterminate
2009	**265**	29.0	17.0	52.1	1.10	4.91	0.952	45.4	Indeterminate
Bold/shading denotes metric did not meet Class B2-3 biocriteria threshold									

At station BIO 2.1, Clay Brook has not been meeting the Class B2-3 biocriteria mainly due to low results in Density. In 2009, passing results for the richness, EPT, PMA-O, BI, % Oligochaeta, EPT/EPT+C, and %PPCS-FG metrics demonstrate a high level of water quality. Although the numbers of organisms appear to be low, this situation most likely reflects a limited food source (nutrients) upstream of the indirect discharge. Water quality and habitat conditions also are likely influenced somewhat by sediment accumulation from stormwater runoff and by iron seepage.

Clay Brook – BIO 2.0 (Downstream)

Kick net field sheets, raw macroinvertebrate kick net results, summary tables, Class B2-3 biocriteria outcome sheets, and graphs for Clay Brook station BIO 2.0 are provided on pages 13 through 24 of Attachment 2, and are summarized in Table 9.

Table 9: Clay Brook – BIO 2.0 (Downstream IDP Station) Biocriteria Compliance Summary

Year	Density	Richness	EPT	% PMA -O	BI	% Oligo.	EPT/ EPT+ C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥40	
2006	403	**25.0**	**12.0**	59.0	2.56	0.25	0.958	46.0	Biocriteria Not Met
2007	330	**24.0**	**14.0**	46.0	2.29	1.00	0.980	**38.0**	Biocriteria Not Met
2008	**280**	26.0	16.0	75.8	2.54	1.43	0.930	58.7	Indeterminate
2009	371	30.0	18.0	68.0	2.15	1.89	0.944	57.2	Biocriteria Met

Bold/shading denotes metric did not meet Class B2-3 biocriteria threshold

The 2009 results met the Class B2-3 biocriteria for the first time in four years of study. Richness continues to increase since 2006 and 2007 when thresholds were not met. The EPT metric has steadily been increasing 2006 and has met Class B2-3 biocriteria during the past two years, which suggests that habitat conditions have improved as a result of the stormwater management upgrades that have been performed in the Clay Brook watershed.

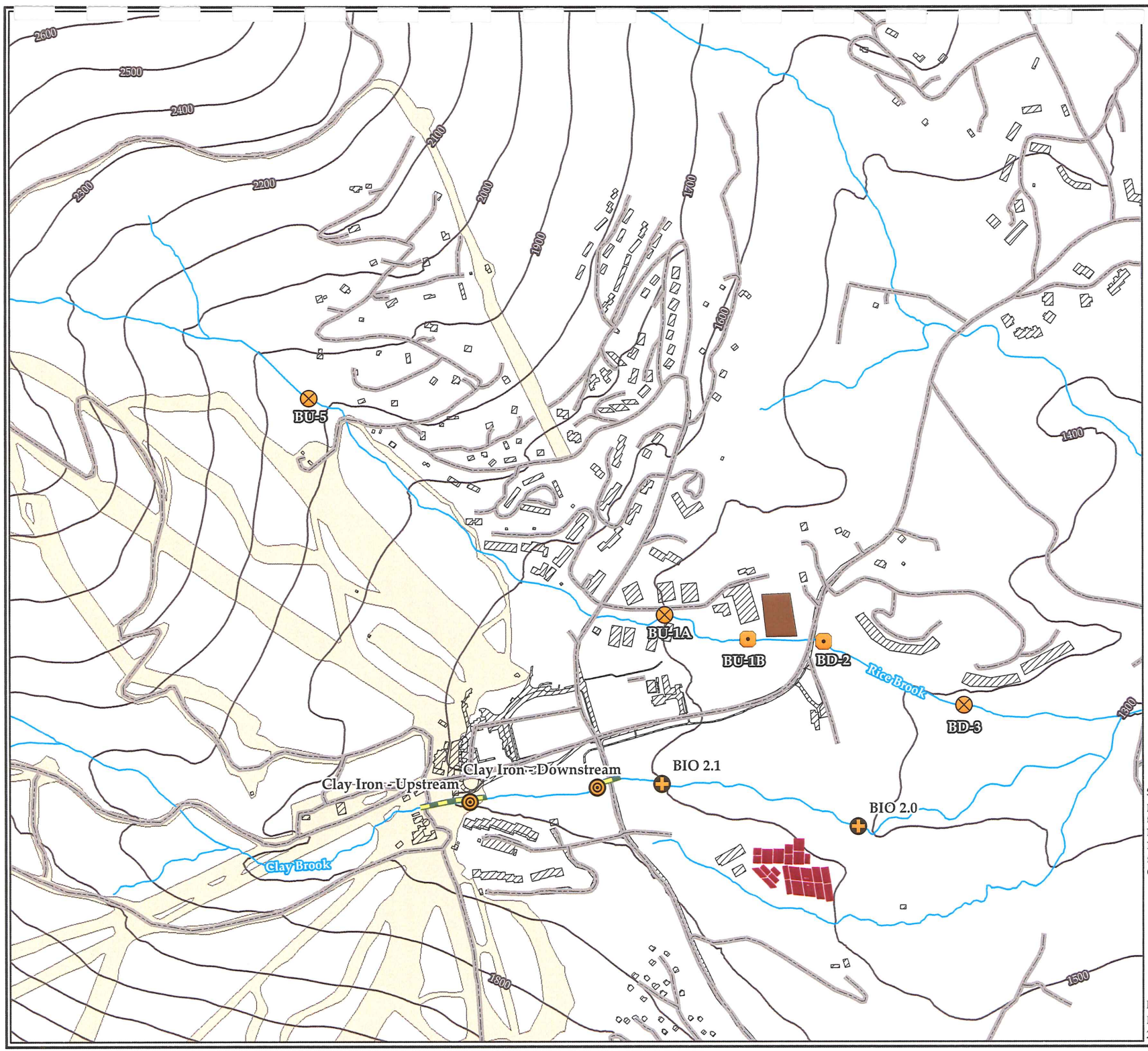
Conclusions

The biomonitoring summary table on page 25 of Attachment 2 presents a matrix summarizing the results of the monitoring at all stations. The 1995 and 1997 through 2009 results indicate an overall improvement in water quality in Rice Brook. Results from Clay Brook indicate improved biologic indicators of water quality, but continued efforts to improve stormwater management and further monitoring are warranted. In Rice Brook, the results show a

consistent improvement in biometrics and biological integrity, and therefore we recommend de-listing Rice Brook from the 303(d) list.

Monitoring results in Clay Brook from 2005 through 2009 show that the stream has not met the Class B2-3 biocriteria primarily due to low populations of the invertebrates that were analyzed. During 2009, the downstream station met Class B2-3 biocriteria for the first time in the four-year study, indicating an improvement in conditions in the watershed. With further progress to remediate iron seeps and manage stormwater runoff, it is anticipated that the upstream stations will also meet the biocriteria. Lower results in Density, Richness, EPT richness, and % PPCS-FG but passing results for the PMA-O, BI, % Oligochaeta, and EPT/EPT+C metrics demonstrate that the water quality is high, and the streambed is not excessively impacted by sedimentation. Although the numbers of organisms remain lower upstream, this situation most likely reflects a limited food source (nutrients) or limiting habitat conditions. The very low Biotic Index scores and dominance of pollution-intolerant species among the aquatic biota confirms that Clay Brook is not polluted or nutrient-enriched. Water quality and habitat conditions are likely influenced by historic impacts from stormwater runoff and by iron seepage. Continued monitoring is recommended to assess the long-term benefit from the application of limestone to the iron seep in 2005 and to determine if additional applications are needed. The next monitoring round will occur during late Summer 2010.

Within the Rice Brook watershed, Sugarbush Resort and the Town of Warren have implemented several projects over the past several years that have improved the hydrologic and sediment transport regimes. In 2005 and 2006, Sugarbush Resort constructed numerous stormwater treatment and control measures associated with the Lincoln Peak Lodge development. In 2006, Sugarbush Resort completed the restoration of two segments of Hotel Brook totaling approximately 350 linear feet. Sugarbush Resort also completed stormwater treatment and control improvement projects in the Sugarbush Village area in the watershed above station BU-5. In 2005, the Town of Warren replaced the undersized and deteriorated culvert at the Sugarbush Access Road with a culvert appropriately sized to transport the discharge and sediment load of Rice Brook without causing downstream channel degradation. These projects have had the cumulative effect of reducing sediment loading and excessive hydrologic inputs into Rice Brook, and as a result, water quality conditions have improved so that the stream has been meeting the Class B2-3 biocriteria consistently. Therefore, we recommend that Rice Brook be de-listed from the 303(d) list.



Sugarbush Resort
Warren, VT
Rice Brook and Clay Brook Biomonitoring Stations Map

January 13, 2009

N

0 400 800 Feet

Legend

- Rice Brook IDP Biomonitoring Stations
- Other Rice Brook Biomonitoring Stations
- Clay Brook IDP Biomonitoring Stations
- Clay Brook Biomonitoring Stations
- Clay Brook and Inferno Rd Culverts
- Lincoln Peak Base Area Leachfield
- MWT Leachfield
- Buildings and Structures
- Ski Trails
- Stream
- Roads
- Contours - 100 ft

Sources: Biomonitoring Stations and leachfields provided by PEA (2003 and 2007); Streams from Vt. Hydrography dataset, VCGI (2005); Roads from e911 roads and VCGI (2005); Infrastructure and ski trails digitized by PEA from CAD/Grenier Consulting Engineers (2006); Contours digitized by PEA (2005).

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LOTIC BENTHOS FIELD SHEET

Site Location:
River (site) Rice Brook River Mile _____ Site ID BU-5 BioLab ID _____
Town Warren Stream Order _____ Drainage Area _____ Km^2 Elevation 1825 ft
Latitude _____ Longitude _____ Lat/Long source (GPS, USGS Map,Datum) _____
Site Description _____

Sampling Information:
Date 9/18/2009 Time 9:00 Personnel (circle sampler) Cathy Szal Gear Kick Net
Effort time (min) 2 Area (m^2) _____ Mesh (um) 590 Quantitative : Y / **N** #Reps 2 Comp/rep 4
Weather cloudy Flow/Weather Previous (2 weeks/2days) quiet couple of weeks
Baseflow _____, or Freshet flow _____ Rising / Receding _____ Present Flow: H - **M** - L

General observations circle those that apply: Overall Aesthetic Rating 0 (poor) – 5 (exc.) 4

A: Debris Obvious Pollution: Sludge, Sawdust, Paper Fiber, **Sand**, Silt, Sewage, Oily Sheen, Trash, Iron, Scum, None

B: Water Clarity **Clear**, Slightly Turbid, Moderately Turbid, Very Turbid, Secci Tube _____ mm

C: Water Color **Clear**, Green, Milky, Brown (Tannic) L M H, Gray, Metallic, Reddish

D: Odors **None**, Musty, Fishy, Sewage, Manure, Sulfur(eggs), Oily/gas

Embeddedness: 0-5% Excel (5) **5-25% V Good (4)** 25-50% Good (3) 50-75% Fair (2) > 75% Poor (1) Estimate _____ %
Silt rating (0-5) 2-3 (0=none, 5= high) CPOM rating (leaf packs) (0-5): 2 (0= none,5=high)
Snags/debris dams # 1 / 100 m (reach)

Bank Stability: EX, **G**, F, P; **Riparian Width** (facing upstream) L >100 ft, R 50 ft

% Canopy: 100 90 **80** 70 60 50 40 30 20 10 0 Overhead = Open, **Partly Open**, or Closed *(See back for Densiometer form)*

Vegetation: (both sides) %: Overstory: Softwood 10 Hardwood 90
(Does not need to add up to 100%) %: Understory: Shrub(brush) 40 Grass _____ Herbaceous 40
Surrounding Land Use: Residential, Ski Area, Forest

Periphyton Cover: For each type 0-100% (*See back for Periphyton Cover Form*)
Diatom 50 % Filamentous green ____ % and length _____ (in) Blue Green 1 % Moss 5 % Green ____ %
Other _____ % General Trophic Rating (0-5) 0 (0=oligo, 5=Eutroph)

General Water Type:
Riffle ✓ Winder _____ Other _____ Warm _____ Cold ✓ Mixed _____
B.F.Width 15-25 (ft) Wetted Width 2-6 (ft) Riffle Depth 2-4 (in) Pool Depth 2 (ft) and Obs _____
Velocity (measured): _____ ft/sec, Velocity RANGE-estimate: _____ <0.4 ft/sec (S) ✓ 0.4-2 ft/sec (M) _____ >2 ft/sec (F)
Channelized: Y / **N** Upstream Dam: Y ____ mi / **N** Other modifications: _____

Water Quality Parameters: Field (Record) or Collected (Circle), Meter (type, #) _____ Chemistry LabId _____
Temp Air 58 °C,°F Water 11 °C fpH _____ lab pH _____ fCond _____ labCond _____ D.O.% _____ D.Omg/l _____

Cond pH Alkalinity Color _____ TSS TP DP Cl SO4 Turb TN N02-3 TNH3 DOC Ca Mg Na K Hardness Metals
Other ____, ____, ____, ____, ____, ____, ____, ____, ____, ____
Field Sheet Complete: CCS (initial) **Photo's:** _____ **Fish Survey Conducted (circle):** Y / **N**

Site Sketch & Observations

Aquatic Biota Observed:

NOTES: Very light iron staining. Active road drainage runoff still carrying water and sediment to Rice Brook mainly below sampling reach. More silt and sand in stream below drainage.

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-5 **Class** Small, High Gradient, B2-3
Sample Date 09/18/09 **Sampler** Cathy Szal

Taxonomic Data								Biotic Index						Richness Metrics			
				#Org's/KN				Biotic Index Scores		Old Biotic Index (1-5)		New Biotic Index (1-10)		Richness	EPT	Richness	EPT
Key	Order	Genus	Species	KN-1	KN-2	FFG	Chiro	Old BI	New BI	KN-1	KN-2	KN-1	KN-2	KN-1	KN-1	KN-2	KN-2
02.03.003.00	DIPTERA	BEZZIA	sp		6	PRD	N	3	6	-	18	-	36	-		1	
02.05.005.00	DIPTERA	BRILLIA	sp		6	SRD	Y	3	5	-	18	-	30	-		1	
02.05.008.00	DIPTERA	CARDIOCLADIUS	sp			PRD	Y	3	5	-	-	-	-	-		-	
02.05.017.00	DIPTERA	CORYNONEURA	sp	2	2	CG	Y	2	4	4	4	8	8	1		1	
02.05.018.00	DIPTERA	CRICOTOPUS	spa			SHR	Y	4	7	-	-	-	-	-		-	
02.05.038.00	DIPTERA	HELENIELLA	sp		2	-	Y	2	4	-	4	-	8	-		1	
02.05.068.00	DIPTERA	PARACHAETOCLADIUS	sp	2		CG	Y	2	2	4	-	4	-	1		-	
02.05.075.00	DIPTERA	PARAMETRIOCNEMUS	sp	2		CG	Y	3	5	6	-	10	-	1		-	
02.05.076.00	DIPTERA	PARAPHAENOCLADIUS	sp	2	2	CG	Y	2	4	4	4	8	8	1		1	
02.05.096.00	DIPTERA	RHEOCRICOTOPUS	sp	2	2	CG	Y	2	6	4	4	12	12	1		1	
02.05.110.00	DIPTERA	THIENEMANNEMYIA	sp	2	8	PRD	Y	3	6	6	24	12	48	1		1	
02.05.114.02	DIPTERA	TVETENIA	bavarica	10	44	CG	Y	2	4	20	88	40	176	1		1	
02.05.121.00	DIPTERA	MICROPSECTRA	sp	6	18	CG	Y	3	6	18	54	36	108	1		1	
02.06.001.00	DIPTERA	DIXA	sp		2	CG	N	2	1	-	4	-	2	-		1	
02.14.004.00	DIPTERA	PROSIMULIUM	sp	6		CF	N	1	2	6	-	12	-	1		-	
02.19.003.00	DIPTERA	DICRANOTA	sp	28	28	PRD	N	2	3	56	56	84	84	1		1	
02.19.006.00	DIPTERA	HEXATOMA	sp	10	12	PRD	N	2	2	20	24	20	24	1		1	
02.19.016.00	DIPTERA	TIPULA	sp			SRD	N	3	6	-	-	-	-	-		-	
02.19.019.00	DIPTERA	MOLOPHILUS	sp		2	CG	N	3	4	-	6	-	8	-		1	
03.01.001.03	EPHEMEROPTERA	BAETIS	flavistriga			CG	N	3	5	-	-	-	-	-	0	-	0
03.01.001.09	EPHEMEROPTERA	BAETIS	tricaudatus	64	32	CG	N	3	6	192	96	384	192	1	1	1	1
03.01.006.93	EPHEMEROPTERA	ACENTRELLAPLAUDITUS	sp	4		SCR	N	2	4	8	-	16	-	1	1	-	0
03.04.005.02	EPHEMEROPTERA	EURYLOPHELLA	funeralis	2	4	SHR	N	1	0	2	4	0	0	1	1	1	1
03.06.003.00	EPHEMEROPTERA	EPEORUS	sp	6	4	CG	N	0	0	0	0	0	0	1	1	1	1
03.06.007.00	EPHEMEROPTERA	STENONEMA	sp			SCR	N	2	3	-	-	-	-	-	0	-	0
03.07.005.00	EPHEMEROPTERA	PARALEPTOPHLEBIA	sp			CG	N	2	1	-	-	-	-	-	0	-	0
04.01.003.00	TRICHOPTERA	MICRASEMA	sp		2	SHR	N	1	2	-	2	-	4	-	0	1	1
04.03.002.00	TRICHOPTERA	GLOSSOSOMA	sp		14	SCR	N	1	0	-	14	-	0	-	0	1	1
04.05.006.00	TRICHOPTERA	PARAPSYCHE	sp	20	32	CF	N	0	0	0	0	0	0	1	1	1	1
04.05.008.04	TRICHOPTERA	SYMPHITOPSYCHE	alhedra	4		CF	N	2	3	8	-	12	-	1	1	-	0
04.05.008.07	TRICHOPTERA	SYMPHITOPSYCHE	sparna	56	8	CF	N	2	4	112	16	224	32	1	1	1	1
04.05.008.09	TRICHOPTERA	SYMPHITOPSYCHE	ventura	4		CF	N	1	3	4	-	12	-	1	1	-	0
04.07.001.00	TRICHOPTERA	LEPIDOSTOMA	sp	10	16	SRD	N	1	1	10	16	10	16	1	1	1	1
04.11.001.00	TRICHOPTERA	PSILOTRETA	sp		2	SCR	N	0	0	-	0	-	0	-	0	1	1
04.12.002.00	TRICHOPTERA	DOLOPHILODES	sp	4	16	CF	N	0	0	0	0	0	0	1	1	1	1
04.16.001.01	TRICHOPTERA	RHYACOPHILA	fuscula	4	10	PRD	N	1	2	4	10	8	20	1	1	1	1
04.16.001.03	TRICHOPTERA	RHYACOPHILA	carolina		8	PRD	N	0	0	-	0	-	0	-	0	1	1
04.16.001.12	TRICHOPTERA	RHYACOPHILA	invaria	4		PRD	N	1	1	4	-	4	-	1	1	-	0
04.14.005.00	TRICHOPTERA	POLYCENTROPUS	sp	2	2	PRD	N	3	6	6	6	12	12	1	1	1	1
04.20.001.00	TRICHOPTERA	APATANIA	sp			SCR	N	1	3	-	-	-	-	-	0	-	0
05.01.000.01	PLECOPTERA	CAPNIIDAE	imm	4	4	SRD	N	1	3	4	4	12	12	1	1	1	1
05.02.000.01	PLECOPTERA	CHLOROPERLIDAE	imm	130	136	PRD	N	0	0	0	0	0	0	1	1	1	1
05.03.000.01	PLECOPTERA	LEUCTRIDAE	imm	190	198	SRD	N	0	0	0	0	0	0	1	1	1	1
05.04.002.00	PLECOPTERA	NEMOURA	sp	2	2	SRD	N	0	1	0	0	2	2	1	1	1	1
05.05.001.00	PLECOPTERA	PELTOPERLA	sp	84	48	SRD	N	1	0	84	48	0	0	1	1	1	1
05.07.006.00	PLECOPTERA	ISOPERLA	sp			PRD	N	1	2	-	-	-	-	-	0	-	0
05.07.006.91	PLECOPTERA	ISOPERLA	sp a			PRD	N	1	2	-	-	-	-	-	0	-	0
05.07.007.00	PLECOPTERA	MALIREKUS	sp	6	8	PRD	N	1	2	6	8	12	16	1	1	1	1
05.08.001.02	PLECOPTERA	PTERONARCYS	proteus			SRD	N	1	0	-	-	-	-	-	0	-	0
06.04.001.00	ODONATA	CORDULEGASTER	sp		2	PRD	N	1	3	-	2	-	6	-		1	
06.06.007.00	ODONATA	LANTHUS	sp			PRD	N	2	5	-	-	-	-	-		-	
07.02.001.00	MEGALOPTERA	SIALIS	sp			PRD	N	3	6	-	-	-	-	-		-	
13.02.002.00	BIVALVIA	PISIDIUM	sp			CF	N	4	8	-	-	-	-	-		-	
18.04.000.00	OLIGOCHAETA	LUMBRICULIDAE	unid			CG	N	-	-	-	-	-	-	-		-	
18.06.000.00	OLIGOCHAETA	LUMBRICINA	unid	12	12	CG	N	-	-	-	-	-	-	1		1	
			TOTAL # of Organisms:	684	694				Total BI Score	592	534	954	864	Total Richness	Total EPT-R	Total Richness	Total EPT-R
									Total # Organisms	684	694	684	694				
									# of Organisms w/o BI	12	12	12	12	31		34	
									Total # Organisms with BI	672	682	672	682		19		19
									Biotic Index	0.88	0.78	1.42	1.27				

Major Taxonomic Group Statistics

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-5
Sample Date 09/18/09

Key	KN-1: Numbers of Organisms										
	COLEOPTERA	DIPTERA	EPHEMEROPTERA	TRICHOPTERA	PLECOPTERA	OLIGOCHAETA	BIVALVIA	MEGALOPTERA	ODONATA	OTHER	TOTAL
02.03.003.00	0	0	0	0	0	0	0	0	0	0	
02.05.005.00	0	0	0	0	0	0	0	0	0	0	
02.05.008.00	0	0	0	0	0	0	0	0	0	0	
02.05.017.00	0	2	0	0	0	0	0	0	0	0	
02.05.018.00	0	0	0	0	0	0	0	0	0	0	
02.05.038.00	0	0	0	0	0	0	0	0	0	0	
02.05.068.00	0	2	0	0	0	0	0	0	0	0	
02.05.075.00	0	2	0	0	0	0	0	0	0	0	
02.05.076.00	0	2	0	0	0	0	0	0	0	0	
02.05.096.00	0	2	0	0	0	0	0	0	0	0	
02.05.110.00	0	2	0	0	0	0	0	0	0	0	
02.05.114.02	0	10	0	0	0	0	0	0	0	0	
02.05.121.00	0	6	0	0	0	0	0	0	0	0	
02.06.001.00	0	0	0	0	0	0	0	0	0	0	
02.14.004.00	0	6	0	0	0	0	0	0	0	0	
02.19.003.00	0	28	0	0	0	0	0	0	0	0	
02.19.006.00	0	10	0	0	0	0	0	0	0	0	
02.19.016.00	0	0	0	0	0	0	0	0	0	0	
02.19.019.00	0	0	0	0	0	0	0	0	0	0	
03.01.001.03	0	0	0	0	0	0	0	0	0	0	
03.01.001.09	0	0	64	0	0	0	0	0	0	0	
03.01.006.93	0	0	4	0	0	0	0	0	0	0	
03.04.005.02	0	0	2	0	0	0	0	0	0	0	
03.06.003.00	0	0	6	0	0	0	0	0	0	0	
03.06.007.00	0	0	0	0	0	0	0	0	0	0	
03.07.005.00	0	0	0	0	0	0	0	0	0	0	
04.01.003.00	0	0	0	0	0	0	0	0	0	0	
04.03.002.00	0	0	0	0	0	0	0	0	0	0	
04.05.006.00	0	0	0	20	0	0	0	0	0	0	
04.05.008.04	0	0	0	4	0	0	0	0	0	0	
04.05.008.07	0	0	0	56	0	0	0	0	0	0	
04.05.008.09	0	0	0	4	0	0	0	0	0	0	
04.07.001.00	0	0	0	10	0	0	0	0	0	0	
04.11.001.00	0	0	0	0	0	0	0	0	0	0	
04.12.002.00	0	0	0	4	0	0	0	0	0	0	
04.16.001.01	0	0	0	4	0	0	0	0	0	0	
04.16.001.03	0	0	0	0	0	0	0	0	0	0	
04.16.001.12	0	0	0	4	0	0	0	0	0	0	
04.14.005.00	0	0	0	2	0	0	0	0	0	0	
04.20.001.00	0	0	0	0	0	0	0	0	0	0	
05.01.000.01	0	0	0	0	4	0	0	0	0	0	
05.02.000.01	0	0	0	0	130	0	0	0	0	0	
05.03.000.01	0	0	0	0	190	0	0	0	0	0	
05.04.002.00	0	0	0	0	2	0	0	0	0	0	
05.05.001.00	0	0	0	0	84	0	0	0	0	0	
05.07.006.00	0	0	0	0	0	0	0	0	0	0	
05.07.006.91	0	0	0	0	0	0	0	0	0	0	
05.07.007.00	0	0	0	0	6	0	0	0	0	0	
05.08.001.02	0	0	0	0	0	0	0	0	0	0	
06.04.001.00	0	0	0	0	0	0	0	0	0	0	
06.06.007.00	0	0	0	0	0	0	0	0	0	0	
07.02.001.00	0	0	0	0	0	0	0	0	0	0	
13.02.002.00	0	0	0	0	0	0	0	0	0	0	
18.04.000.00	0	0	0	0	0	0	0	0	0	0	
18.06.000.00	0	0	0	0	0	12	0	0	0	0	
Total	**0**	**72**	**76**	**108**	**416**	**12**	**0**	**0**	**0**	**0**	**684**
Percent	**0.00%**	**10.5%**	**11.1%**	**15.8%**	**60.8%**	**1.75%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**100%**

Major Taxonomic Group Statistics

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-5
Sample Date 09/18/09

Key	KN-2: Numbers of Organisms										
	COLEOPTERA	DIPTERA	EPHEMEROPTERA	TRICHOPTERA	PLECOPTERA	OLIGOCHAETA	BIVALVIA	MEGALOPTERA	ODONATA	OTHER	TOTAL
02.03.003.00	0	6	0	0	0	0	0	0	0	0	
02.05.005.00	0	6	0	0	0	0	0	0	0	0	
02.05.008.00	0	0	0	0	0	0	0	0	0	0	
02.05.017.00	0	2	0	0	0	0	0	0	0	0	
02.05.018.00	0	0	0	0	0	0	0	0	0	0	
02.05.038.00	0	2	0	0	0	0	0	0	0	0	
02.05.068.00	0	0	0	0	0	0	0	0	0	0	
02.05.075.00	0	0	0	0	0	0	0	0	0	0	
02.05.076.00	0	2	0	0	0	0	0	0	0	0	
02.05.096.00	0	2	0	0	0	0	0	0	0	0	
02.05.110.00	0	8	0	0	0	0	0	0	0	0	
02.05.114.02	0	44	0	0	0	0	0	0	0	0	
02.05.121.00	0	18	0	0	0	0	0	0	0	0	
02.06.001.00	0	2	0	0	0	0	0	0	0	0	
02.14.004.00	0	0	0	0	0	0	0	0	0	0	
02.19.003.00	0	28	0	0	0	0	0	0	0	0	
02.19.006.00	0	12	0	0	0	0	0	0	0	0	
02.19.016.00	0	0	0	0	0	0	0	0	0	0	
02.19.019.00	0	2	0	0	0	0	0	0	0	0	
03.01.001.03	0	0	0	0	0	0	0	0	0	0	
03.01.001.09	0	0	32	0	0	0	0	0	0	0	
03.01.006.93	0	0	0	0	0	0	0	0	0	0	
03.04.005.02	0	0	4	0	0	0	0	0	0	0	
03.06.003.00	0	0	4	0	0	0	0	0	0	0	
03.06.007.00	0	0	0	0	0	0	0	0	0	0	
03.07.005.00	0	0	0	0	0	0	0	0	0	0	
04.01.003.00	0	0	0	2	0	0	0	0	0	0	
04.03.002.00	0	0	0	14	0	0	0	0	0	0	
04.05.006.00	0	0	0	32	0	0	0	0	0	0	
04.05.008.04	0	0	0	0	0	0	0	0	0	0	
04.05.008.07	0	0	0	8	0	0	0	0	0	0	
04.05.008.09	0	0	0	0	0	0	0	0	0	0	
04.07.001.00	0	0	0	16	0	0	0	0	0	0	
04.11.001.00	0	0	0	2	0	0	0	0	0	0	
04.12.002.00	0	0	0	16	0	0	0	0	0	0	
04.16.001.01	0	0	0	10	0	0	0	0	0	0	
04.16.001.03	0	0	0	8	0	0	0	0	0	0	
04.16.001.12	0	0	0	0	0	0	0	0	0	0	
04.14.005.00	0	0	0	2	0	0	0	0	0	0	
04.20.001.00	0	0	0	0	0	0	0	0	0	0	
05.01.000.01	0	0	0	0	4	0	0	0	0	0	
05.02.000.01	0	0	0	0	136	0	0	0	0	0	
05.03.000.01	0	0	0	0	198	0	0	0	0	0	
05.04.002.00	0	0	0	0	2	0	0	0	0	0	
05.05.001.00	0	0	0	0	48	0	0	0	0	0	
05.07.006.00	0	0	0	0	0	0	0	0	0	0	
05.07.006.91	0	0	0	0	0	0	0	0	0	0	
05.07.007.00	0	0	0	0	8	0	0	0	0	0	
05.08.001.02	0	0	0	0	0	0	0	0	0	0	
06.04.001.00	0	0	0	0	0	0	0	0	2	0	
06.06.007.00	0	0	0	0	0	0	0	0	0	0	
07.02.001.00	0	0	0	0	0	0	0	0	0	0	
13.02.002.00	0	0	0	0	0	0	0	0	0	0	
18.04.000.00	0	0	0	0	0	0	0	0	0	0	
18.06.000.00	0	0	0	0	0	12	0	0	0	0	
Total	**0**	**134**	**40**	**110**	**396**	**12**	**0**	**0**	**2**	**0**	**694**
Percent	**0.00%**	**19.3%**	**5.76%**	**15.9%**	**57.1%**	**1.73%**	**0.00%**	**0.00%**	**0.29%**	**0.00%**	**100%**

Functional Feeding Group Analysis

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-5
Sample Date 09/18/09

Key	KN-1: Numbers of Organisms								KN-2: Numbers of Organisms							
	CG	CF	PRD	SRD	SHR	SCR	No FG Designation	Total	CG	CF	PRD	SRD	SHR	SCR	No FG Designation	Total
02.03.003.00	0	0	0	0	0	0	0		0	0	6	0	0	0	0	
02.05.005.00	0	0	0	0	0	0	0		0	0	0	6	0	0	0	
02.05.008.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.05.017.00	2	0	0	0	0	0	0		2	0	0	0	0	0	0	
02.05.018.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.05.038.00	0	0	0	0	0	0	0		0	0	0	0	0	0	2	
02.05.068.00	2	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.05.075.00	2	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.05.076.00	2	0	0	0	0	0	0		2	0	0	0	0	0	0	
02.05.096.00	2	0	0	0	0	0	0		2	0	0	0	0	0	0	
02.05.110.00	0	0	2	0	0	0	0		0	0	8	0	0	0	0	
02.05.114.02	10	0	0	0	0	0	0		44	0	0	0	0	0	0	
02.05.121.00	6	0	0	0	0	0	0		18	0	0	0	0	0	0	
02.06.001.00	0	0	0	0	0	0	0		2	0	0	0	0	0	0	
02.14.004.00	0	6	0	0	0	0	0		0	0	0	0	0	0	0	
02.19.003.00	0	0	28	0	0	0	0		0	0	28	0	0	0	0	
02.19.006.00	0	0	10	0	0	0	0		0	0	12	0	0	0	0	
02.19.016.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.19.019.00	0	0	0	0	0	0	0		2	0	0	0	0	0	0	
03.01.001.03	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
03.01.001.09	64	0	0	0	0	0	0		32	0	0	0	0	0	0	
03.01.006.93	0	0	0	0	0	4	0		0	0	0	0	0	0	0	
03.04.005.02	0	0	0	0	2	0	0		0	0	0	0	4	0	0	
03.06.003.00	6	0	0	0	0	0	0		4	0	0	0	0	0	0	
03.06.007.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
03.07.005.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
04.01.003.00	0	0	0	0	0	0	0		0	0	0	0	2	0	0	
04.03.002.00	0	0	0	0	0	0	0		0	0	0	0	0	14	0	
04.05.006.00	0	20	0	0	0	0	0		0	32	0	0	0	0	0	
04.05.008.04	0	4	0	0	0	0	0		0	0	0	0	0	0	0	
04.05.008.07	0	56	0	0	0	0	0		0	8	0	0	0	0	0	
04.05.008.09	0	4	0	0	0	0	0		0	0	0	0	0	0	0	
04.07.001.00	0	0	0	10	0	0	0		0	0	0	16	0	0	0	
04.11.001.00	0	0	0	0	0	0	0		0	0	0	0	0	2	0	
04.12.002.00	0	4	0	0	0	0	0		0	16	0	0	0	0	0	
04.16.001.01	0	0	4	0	0	0	0		0	0	10	0	0	0	0	
04.16.001.03	0	0	0	0	0	0	0		0	0	8	0	0	0	0	
04.16.001.12	0	0	4	0	0	0	0		0	0	0	0	0	0	0	
04.14.005.00	0	0	2	0	0	0	0		0	0	2	0	0	0	0	
04.20.001.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
05.01.000.01	0	0	0	4	0	0	0		0	0	0	4	0	0	0	
05.02.000.01	0	0	130	0	0	0	0		0	0	136	0	0	0	0	
05.03.000.01	0	0	0	190	0	0	0		0	0	0	198	0	0	0	
05.04.002.00	0	0	0	2	0	0	0		0	0	0	2	0	0	0	
05.05.001.00	0	0	0	84	0	0	0		0	0	0	48	0	0	0	
05.07.006.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
05.07.006.91	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
05.07.007.00	0	0	6	0	0	0	0		0	0	8	0	0	0	0	
05.08.001.02	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
06.04.001.00	0	0	0	0	0	0	0		0	0	2	0	0	0	0	
06.06.007.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
07.02.001.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
13.02.002.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
18.04.000.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
18.06.000.00	12	0	0	0	0	0	0		12	0	0	0	0	0	0	
Total	**108**	**94**	**186**	**290**	**2**	**4**	**0**	**684**	**120**	**56**	**220**	**274**	**6**	**16**	**2**	**694**
Percent	**15.8%**	**13.7%**	**27.2%**	**42.4%**	**0.29%**	**0.58%**	**0.00%**	**100%**	**17.3%**	**8.07%**	**31.7%**	**39.5%**	**0.86%**	**2.31%**	**0.29%**	**100%**

Functional Feeding Group Analysis

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-5
Sample Date 09/18/09

	Model			Kicknet 1 vs. SHG		Kicknet 2 vs. SHG	
	SHG	MHG	WWMG	KN-1	PPCS	KN-2	PPCS
Col. Gath.	31%	32%	22%	15.8%	50.9%	17.3%	55.8%
Col. Filt.	18%	30%	36%	13.7%	76.3%	8.1%	44.8%
Predator	19%	13%	7%	27.2%	69.9%	31.7%	59.9%
Shred-Det.	15%	4%	2%	42.4%	35.4%	39.5%	38.0%
Shred- Herb.	1%	1%	5%	0.29%	29.2%	0.86%	86.5%
Scraper	12%	13%	22%	0.58%	4.87%	2.31%	19.2%
				PPCS-FG =	44.4%	PPCS-FG =	50.7%

CG = Collector/Gatherer

CF = Collector/Filterer

PRD = Predator

SRD = Shredder - Detritus

SHR = Shredder - Herbivore

SCR = Scraper

Percent Model Affinity of Orders (PMA-O) Calculations

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook **Class** Small, High Gradient, B2-3
Location BU-5
Sample Date 09/18/09 **Sampler** Cathy Szal

Order	Model			Kicknet 1 vs. Model (SHG)		Kicknet 2 vs. Model (SHG)	
	SHG	MHG	WWMG	%	difference	%	difference
Coleoptera	8%	6%	13%	0.00%	8.00	0.00%	8.00
Diptera	19%	18%	13%	10.5%	8.47	19.3%	0.308
Ephemeroptera	23%	34%	32%	11.1%	11.9	5.76%	17.2
Plecoptera	21%	8%	8%	60.8%	39.8	57.1%	36.1
Trichoptera	28%	33%	33%	15.8%	12.2	15.9%	12.1
Oligochaeta	0.5%	0.5%	1.0%	1.75%	1.25	1.73%	1.23
Other	0.5%	0.5%	1.0%	0.00%	0.500	0.29%	0.212
				Sum diff	82.1		75.2
				Sum diff * 0.5	41.1		37.6
				100-(sum diff * 0.5)	58.9		62.4
				% model affinity	**58.9%**		**62.4%**

EPT / EPT+C Calculations

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-5
Sample Date 09/18/09
Class Small, High Gradient, B2-3
Sampler Cathy Szal

	KN-1	KN-2
#EPT organisms	600	546
#C organisms	28	84
EPT/EPT+C	0.96	0.87

Biometric Summary

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook **Class** Small, High Gradient, B2-3
Location BU-5
Sample Date 09/18/09 **Sampler** Cathy Szal

Replicate # Sampling Method	1 KN	2 KN	Average KN
Biometrics:			
Density/Unit	684	694	689
Species Richness	31.0	34.0	32.5
EPT Richness	19.0	19.0	19.0
Old Bio Index (0 to 5)	0.881	0.783	0.832
New Bio Index (0 to 10)	1.42	1.27	1.34
% dominant taxa	27.8%	28.5%	28.2%
EPT/EPT+C	0.955	0.867	0.911
EPT/Richness	0.613	0.559	0.585
% Model Affinity (orders)	58.9%	62.4%	60.7%
PPCS - functional groups	44.4%	50.7%	47.6%
Major Groups:			
Coleoptera (%)	0.00%	0.00%	0.00%
Diptera (%)	10.5%	19.3%	14.9%
Ephemeroptera (%)	11.1%	5.76%	8.44%
Trichoptera (%)	15.8%	15.9%	15.8%
Plecoptera (%)	60.8%	57.1%	58.9%
Oligochaeta (%)	1.75%	1.73%	1.74%
Bivalvia (%)	0.00%	0.00%	0.00%
Megaloptera (%)	0.00%	0.00%	0.00%
Odonata (%)	0.00%	0.29%	0.14%
Other (%)	0.00%	0.00%	0.00%
Total (%)	100%	100%	100%
Feeding Groups:			
Collector Gatherer (%)	15.8%	17.3%	16.5%
Collector Filterer (%)	13.7%	8.07%	10.9%
Predator (%)	27.2%	31.7%	29.4%
Shredder - Detritus (%)	42.4%	39.5%	40.9%
Shredder - Herbivore (%)	0.29%	0.86%	0.58%
Scraper (%)	0.58%	2.31%	1.45%
No FG Designation (%)	0.00%	0.29%	0.14%
Total (%)	100%	100%	100%

Prepared By VHB Pioneer
Project MWT Summer Biomonitoring
Station Upstream **Latitude** 44°8'31.32"N
Stream Rice Brook **Longitude** 72°53'56.01"W
Location BU-5 **Class** Small, High Gradient, B2-3
Sample Date 09/18/09 **Sampler** Cathy Szal

APPLICATION OF STATE OF VERMONT DEC BIOCRITERIA (2/10/04)

Metric	Value	Metric Scoring Results Based on DEC Thresholds for SHG Streams					
		Class B2-3		Class B1		Class A	
		Threshold	Outcome	Threshold	Outcome	Threshold	Outcome
Density	689	≥300	Pass	≥400	Pass	≥500	Pass
Richness	32.5	≥27	Pass	≥31	Pass	≥35	Fail
EPT	19.0	≥16	Pass	≥19	I+	≥21	Fail
% PMA-O	60.7%	≥45%	Pass	≥55%	Pass	≥65%	I-
BI (New 1-10)	1.34	≤4.50	Pass	≤3.50	Pass	≤3.00	Pass
% Oligo	1.74%	≤12%	Pass	≤5	Pass	≤2	I+
EPT/EPT+C	0.911	≥0.45	Pass	≥0.55	Pass	≥0.65	Pass
% PPCS-FG	47.6%	≥ 40%	Pass	≥ 45%	I+	≥ 50%	I-
Outcome:		**Biocriteria are met**					
The following metrics do not meet Class B2-3 thresholds:		NA					

Individual Metric Outcome Guidelines (using the table below)
1) A metric is scored "pass" when the result meets the full support requirements
2) A metric is scored "I+" when the result is between the threshold level and the full support level
3) A metric is scored "I-" when the result is between the threshold level and the non-support level
4) A metric is scored "Fail" when the result is below the non-support requirements

Overall Outcome Guidelines
1) Biocriteria are "met" when: a) five or more metrics are scored "pass" and no metrics have a score of "I-" or "Fail".
2) Biocriteria are "not met" when one or more metrics are scored "failed".
3) In situations where neither items 1 or 2 are the result, an "indeterminate" finding will be made

Scoring Guidelines - Wadeable Stream Category SHG

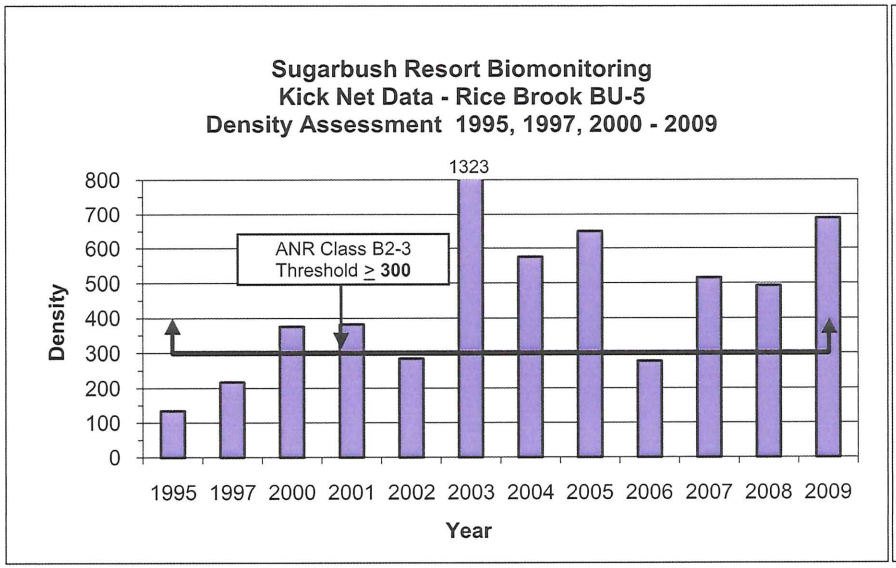
WQ Class	Score	Density	Richness	EPT	PMA-O	BI	% Oligo	EPT/ EPT+C	PPCS-F
A-1	Full Support	>605	>36	>22	>70%	<2.70	<1%	>0.67	>55%
	Threshold	≥500	≥35	≥21	≥65%	≤3	≤2%	≥0.65	≥50%
	Non-Support	<450	<34	<20	<60%	>3.30	>3%	<0.63	<45%
B1	Full Support	>450	>32	>20	>60%	<3.35	<3.5%	>0.57	>50%
	Threshold	≥400	≥31	≥19	≥55%	≤3.5	≤5%	≥0.55	≥45%
	Non-Support	<350	<30	<18	<50%	>3.65	>6.5%	<0.53	<40%
B2-3	Full Support	>350	>28	>17	>50%	<4.35	<9.5%	>0.47	>45%
	Threshold	≥300	≥27	≥16	≥45%	≤4.5	≤12%	≥0.45	≥40%
	Non-Support	<250	<26	<15	<40%	>4.65	>14.5%	<0.43	<35%

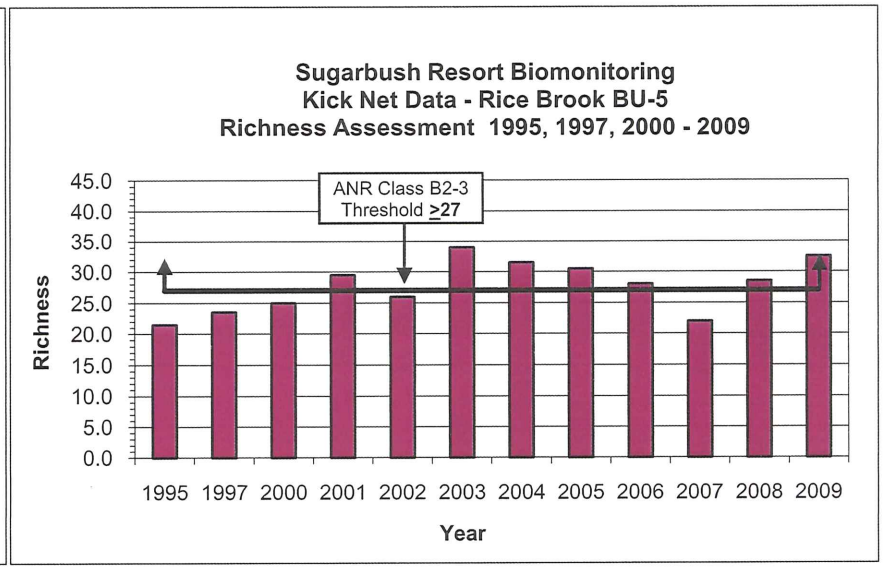
Sugarbush Resort Biomonitoring
Kick Net Data - Rice Brook BU-5
Class B2-3

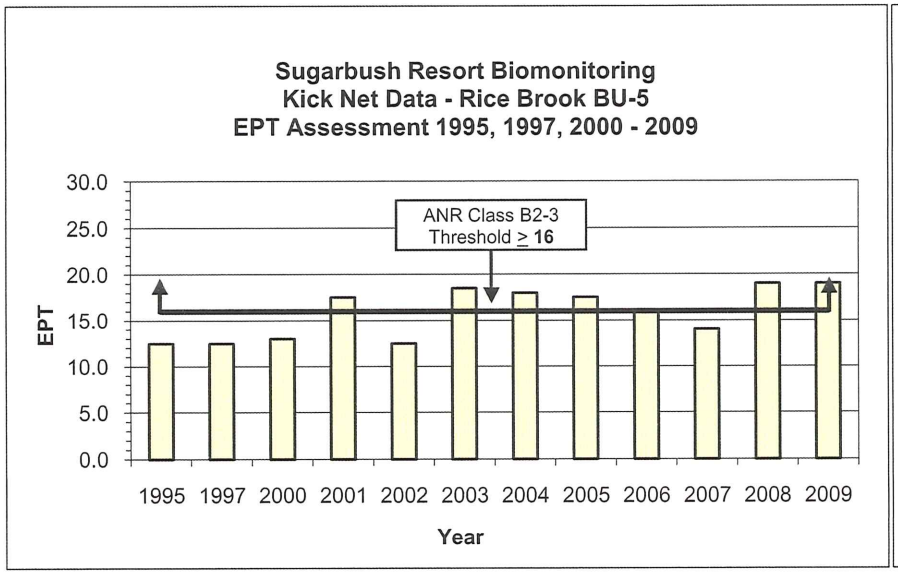
Year	Density	Richness	EPT	% PMA-O	BI	% Oligo.	EPT/EPT +C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥40	
1995	**135**	**21.5**	**12.5**	59.0	1.61	0.00	0.790	**32.0**	Biocriteria Not Met
1997	**217**	**23.5**	**12.5**	72.0	1.31	0.50	0.820	42.0	Biocriteria Not Met
2000	375	**25.0**	**13.00**	63.1	1.67	0.90	0.800	42.0	Biocriteria Not Met
2001	382	29.5	17.5	54.8	1.74	0.80	0.680	40.0	Biocriteria Met
2002	**284**	**26.0**	**12.5**	56.8	2.22	0.50	0.640	**37.0**	Biocriteria Not Met
2003	1323	34.0	18.5	61.1	2.00	3.00	0.860	**37.0**	Indeterminate
2004	575	31.5	18.0	62.8	1.83	2.10	0.800	**38.0**	Indeterminate
2005	650	30.5	17.5	62.4	1.69	3.30	0.790	41.0	Biocriteria Met
2006	**277**	28.0	16.0	63.0	2.13	1.90	0.690	41.0	Indeterminate
2007	515	**22.0**	**14.0**	67.7	1.31	1.59	0.949	51.7	Biocriteria Not Met
2008	493	28.5	19.0	63.6	0.91	1.87	0.907	47.0	Biocriteria Met
2009	689	32.5	19.0	60.7	1.34	1.74	0.911	47.6	Biocriteria Met

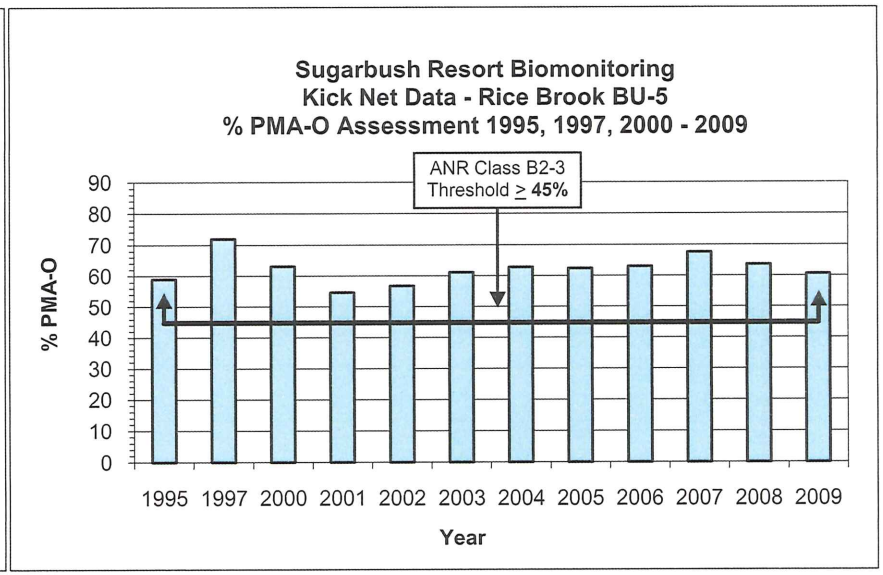
Bold/shade denotes metric did not meet Class B2-3 biocriteria threshold

Sugargush Resort Biomonitoring
Kick Net Data - Rice Brook BU-5
Summary Metric Charts

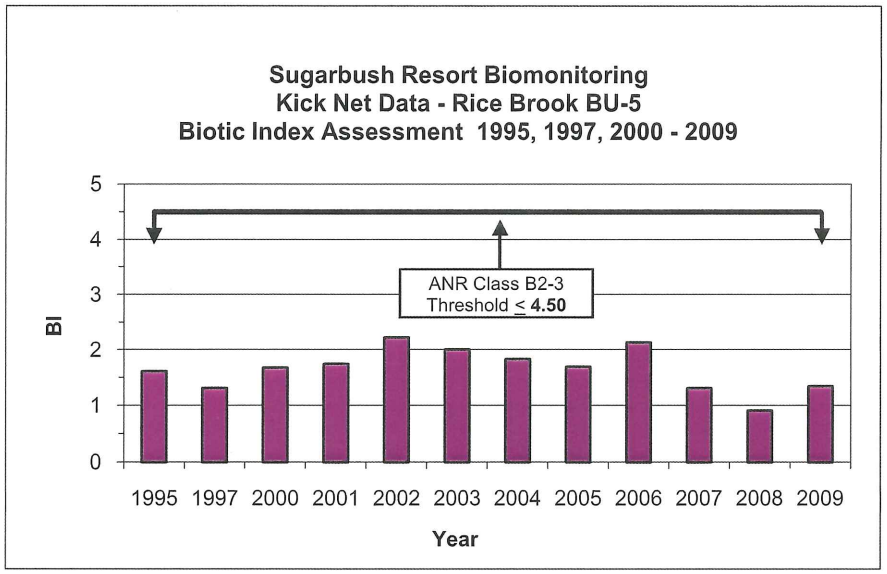


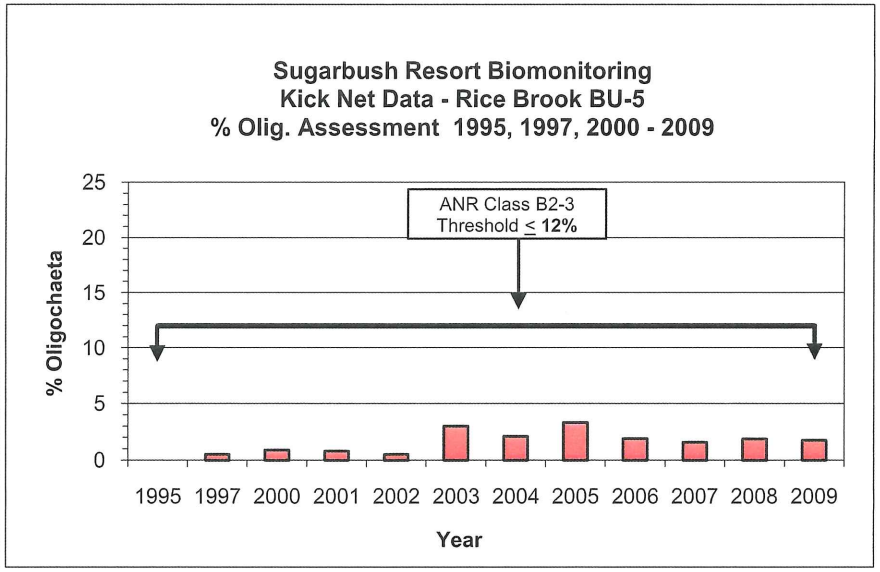


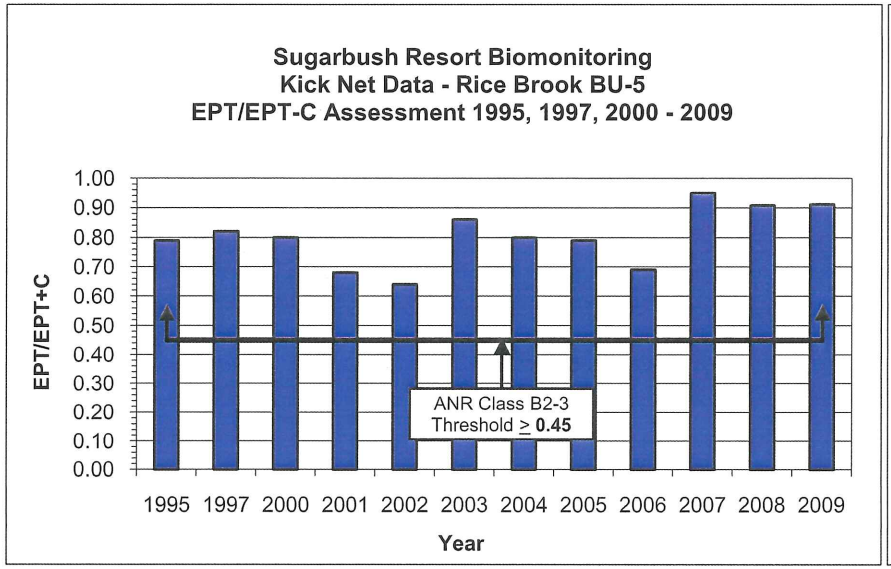


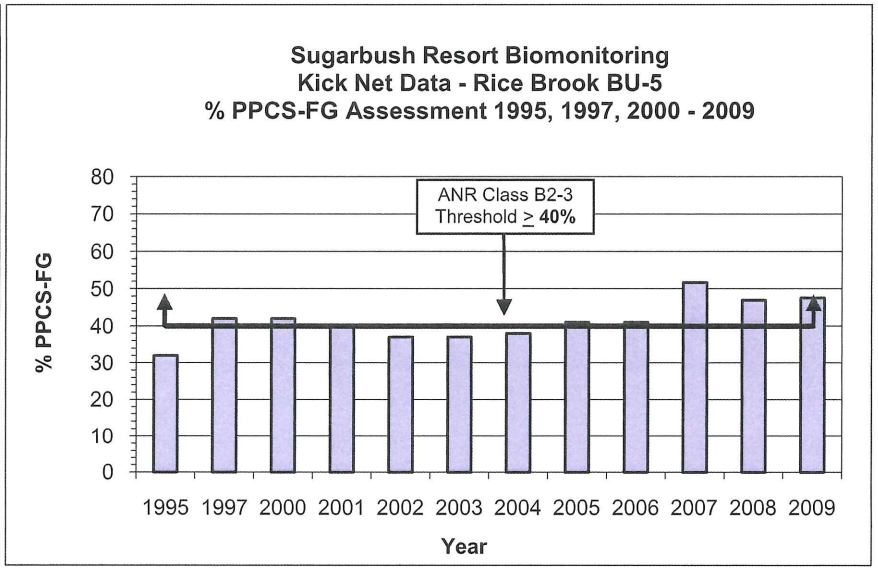


Sugargush Resort Biomonitoring
Kick Net Data - Rice Brook BU-5
Summary Metric Charts









LOTIC BENTHOS FIELD SHEET

Site Location:
River (site) ___Rice Brook_____River Mile _____Site ID___BU-1A_____ BioLab ID _____
Town_____Warren_____ Stream Order_____ Drainage Area _____Km² Elevation __1500_ft
Latitude _____ Longitude _____ Lat/Long source (GPS, USGS Map,Datum) _____
Site Description_____

Sampling Information:
Date__9/18/2009__Time__10:00__Personnel (circle sampler)___Cathy Szal___ Gear__Kick Net__
Effort time (min)__2__Area (m²)_____ Mesh (um)__590___Quantitative : Y / **N** #Reps__2_____Comp/rep __4
Weather___cloudy_____ Flow/Weather Previous (2 weeks/2days)___a couple quiet weeks
Baseflow_____, or Freshet flow_____ Rising / Receding _____ Present Flow: H - **M** - L

General observations circle those that apply: Overall Aesthetic Rating 0 (poor) – 5 (exc.)__3 -4

A: Debris Obvious Pollution: Sludge, Sawdust, Paper Fiber, **Sand**, Silt, Sewage, Oily Sheen, Trash, **Iron**, Scum, None

B: Water Clarity **Clear**, Slightly Turbid, Moderately Turbid, Very Turbid, Secci Tube_____mm

C: Water Color **Clear**, Green, Milky, Brown (Tannic) L M H , Gray, Metallic, Reddish

D: Odors **None**, Musty, Fishy, Sewage, Manure, Sulfur(eggs), Oily/gas

Embeddedness: 0-5% Excel (5) 5-25% V Good (4) **25-50% Good (3)** 50-75% Fair (2) > 75% Poor (1) Estimate_____%
Silt rating (0-5)__3-4__(0=none, 5= high) CPOM rating (leaf packs) (0-5):__3__(0= none,5=high)
Snags/debris dams #__0__/__100__m (reach)

Bank Stability: EX, **G** , F , P ; **Riparian Width** (facing upstream) L_20_ft, R_20_ft

% Canopy: 100 90 **80** 70 60 50 40 30 20 10 0 Overhead = Open, **Partly Open**, or Closed *(See back for Densiometer form)*

Vegetation: (both sides) %: Overstory: Softwood __25__Hardwood__75
(Does not need to add up to 100%) %: Understory: Shrub(brush)__30__Grass__10__Herbaceous__40
Surrounding Land Use:__Residential, Ski Area, Forest

Periphyton Cover: For each type 0-100% (*See back for Periphyton Cover Form*)
Diatom __50__% Filamentous green ____% and length _____(in) Blue Green __1-2__% Moss __5__% Green_____ %
Other _____% General Trophic Rating (0-5)__1__(0=oligo, 5=Eutroph)

General Water Type:
Riffle__✓__Winder _____ Other _____ Warm _____ Cold __✓__Mixed _____
B.F.Width___(ft) Wetted Width_____(ft) Riffle Depth____(in) Pool Depth_____(ft) and Obs _____
Velocity (measured): _____ ft/sec, Velocity RANGE-estimate: _____ <0.4 ft/sec (S)__✓__ 0.4-2 ft/sec (M) _____ >2 ft/sec (F)
Channelized: Y / **N** Upstream Dam: Y ____mi / **N** Other modifications:__culverts_____

Water Quality Parameters: Field (Record) or Collected (Circle), Meter (type, #)_____Chemistry LabId_____
Temp Air_60__ °C,°F Water_11__°C fpH_____lab pH_____ fCond_____labCond _____D.O.%_____ D.Omg/l_____

Cond pH Alkalinity Color_____ TSS TP DP Cl SO4 Turb TN N02-3 TNH3 DOC Ca Mg Na K Hardness Metals Other____,____,____,____,____,____,____,____,____,____
Field Sheet Complete:__CCS__(initial) **Photo's:** _____ **Fish Survey Conducted (circle):** Y / **N**

Site Sketch & Observations

Aquatic Biota Observed: Trout

NOTES: Light iron staining

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook **Class** Small, High Gradient, B2-3
Location BU-1A
Sample Date 09/18/09 **Sampler** Cathy Szal

Taxonomic Data								Biotic Index						Richness Metrics			
Key	Order	Genus	Species	#Org's/KN		FFG	Chiro	Biotic Index Scores		Old Biotic Index (1-5)		New Biotic Index (1-10)		Richness	EPT	Richness	EPT
				KN-1	KN-2			Old BI	New BI	KN-1	KN-2	KN-1	KN-2	KN-1	KN-1	KN-2	KN-2
02.03.003.00	DIPTERA	BEZZIA	sp			PRD	N	3	6	-	-	-	-	-		-	
02.05.005.00	DIPTERA	BRILLIA	sp	1	8	SRD	Y	3	5	3	24	5	40	1		1	
02.05.008.00	DIPTERA	CARDIOCLADIUS	sp			PRD	Y	3	5	-	-	-	-	-		-	
02.05.017.00	DIPTERA	CORYNONEURA	sp	4	2	CG	Y	2	4	8	4	16	8	1		1	
02.05.018.00	DIPTERA	CRICOTOPUS	spa			SHR	Y	4	7	-	-	-	-	-		-	
02.05.068.00	DIPTERA	PARACHAETOCLADIUS	sp			CG	Y	2	2	-	-	-	-	-		-	
02.05.075.00	DIPTERA	PARAMETRIOCNEMUS	sp	19	19	CG	Y	3	5	57	57	95	95	1		1	
02.05.076.00	DIPTERA	PARAPHAENOCLADIUS	sp	4	10	CG	Y	2	4	8	20	16	40	1		1	
02.05.085.05	DIPTERA	POLYPEDILUM	aviceps		1	CG	Y	3	5	-	3	-	5	-		1	
02.05.096.00	DIPTERA	RHEOCRICOTOPUS	sp	1	1	CG	Y	2	6	2	2	6	6	1		1	
02.05.110.00	DIPTERA	THIENEMANNEMYIA	sp	4	1	PRD	Y	3	6	12	3	24	6	1		1	
02.05.114.02	DIPTERA	TVETENIA	bavarica	14	22	CG	Y	2	4	28	44	56	88	1		1	
02.05.121.00	DIPTERA	MICROPSECTRA	sp	1		CG	Y	3	6	3	-	6	-	1		-	
02.06.001.00	DIPTERA	DIXA	sp	2	1	CG	N	2	1	4	2	2	1	1		1	
02.14.004.00	DIPTERA	PROSIMULIUM	sp	1		CF	N	1	2	1	-	2	-	1		-	
02.19.003.00	DIPTERA	DICRANOTA	sp	2	1	PRD	N	2	3	4	2	6	3	1		1	
02.19.006.00	DIPTERA	HEXATOMA	sp	5	6	PRD	N	2	2	10	12	10	12	1		1	
02.19.016.00	DIPTERA	TIPULA	sp	10	1	SRD	N	3	6	30	3	60	6	1		1	
02.19.019.00	DIPTERA	MOLOPHILUS	sp			CG	N	3	4	-	-	-	-	-		-	
03.01.001.03	EPHEMEROPTERA	BAETIS	flavistriga			CG	N	3	5	-	-	-	-	-	0	-	0
03.01.001.09	EPHEMEROPTERA	BAETIS	tricaudatus	6	5	CG	N	3	6	18	15	36	30	1	1	1	1
03.01.006.93	EPHEMEROPTERA	ACENTRELLAPLAUDITUS	sp	5	1	SCR	N	2	4	10	2	20	4	1	1	1	1
03.04.005.02	EPHEMEROPTERA	EURYLOPHELLA	funeralis		1	SHR	N	1	0	-	1	-	0	-	0	1	1
03.06.003.00	EPHEMEROPTERA	EPEORUS	sp	5		CG	N	0	0	0	-	0	-	1	1	-	0
03.06.007.00	EPHEMEROPTERA	STENONEMA	sp			SCR	N	2	3	-	-	-	-	-	0	-	0
03.07.005.00	EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	1	2	CG	N	2	1	2	4	1	2	1	1	1	1
04.01.003.00	TRICHOPTERA	MICRASEMA	sp	1	4	SHR	N	1	2	1	4	2	8	1	1	1	1
04.03.002.00	TRICHOPTERA	GLOSSOSOMA	sp		1	SCR	N	1	0	-	1	-	0	-	0	1	1
04.05.006.00	TRICHOPTERA	PARAPSYCHE	sp	14	14	CF	N	0	0	0	0	0	0	1	1	1	1
04.05.008.04	TRICHOPTERA	SYMPHITOPSYCHE	alhedra	12	19	CF	N	2	3	24	38	36	57	1	1	1	1
04.05.008.07	TRICHOPTERA	SYMPHITOPSYCHE	sparna	20	18	CF	N	2	4	40	36	80	72	1	1	1	1
04.05.008.09	TRICHOPTERA	SYMPHITOPSYCHE	ventura	5	5	CF	N	1	3	5	5	15	15	1	1	1	1
04.07.001.00	TRICHOPTERA	LEPIDOSTOMA	sp	6	13	SRD	N	1	1	6	13	6	13	1	1	1	1
04.11.001.00	TRICHOPTERA	PSILOTRETA	sp	1		SCR	N	0	0	0	-	0	-	1	1	-	0
04.12.002.00	TRICHOPTERA	DOLOPHILODES	sp		1	CF	N	0	0	-	0	-	0	-	0	1	1
04.16.001.01	TRICHOPTERA	RHYACOPHILA	fuscula	11	6	PRD	N	1	2	11	6	22	12	1	1	1	1
04.16.001.03	TRICHOPTERA	RHYACOPHILA	carolina			PRD	N	0	0	-	-	-	-	-	0	-	0
04.16.001.12	TRICHOPTERA	RHYACOPHILA	invaria		1	PRD	N	1	1	-	1	-	1	-	0	1	1
04.14.005.00	TRICHOPTERA	POLYCENTROPUS	sp			PRD	N	3	6	-	-	-	-	-	0	-	0
04.20.001.00	TRICHOPTERA	APATANIA	sp			SCR	N	1	3	-	-	-	-	-	0	-	0
05.01.000.01	PLECOPTERA	CAPNIIDAE	imm	1	1	SRD	N	1	3	1	1	3	3	1	1	1	1
05.02.000.01	PLECOPTERA	CHLOROPERLIDAE	imm	90	84	PRD	N	0	0	0	0	0	0	1	1	1	1
05.03.000.01	PLECOPTERA	LEUCTRIDAE	imm	77	78	SRD	N	0	0	0	0	0	0	1	1	1	1
05.04.002.00	PLECOPTERA	NEMOURA	sp		1	SRD	N	0	1	-	0	-	1	-	0	1	1
05.05.001.00	PLECOPTERA	PELTOPERLA	sp	6	10	SRD	N	1	0	6	10	0	0	1	1	1	1
05.07.006.00	PLECOPTERA	ISOPERLA	sp			PRD	N	1	2	-	-	-	-	-	0	-	0
05.07.006.91	PLECOPTERA	ISOPERLA	sp a			PRD	N	1	2	-	-	-	-	-	0	-	0
05.07.007.00	PLECOPTERA	MALIREKUS	sp	19	23	PRD	N	1	2	19	23	38	46	1	1	1	1
05.08.001.02	PLECOPTERA	PTERONARCYS	proteus		2	SRD	N	1	0	-	2	-	0	-	0	1	1
06.04.001.00	ODONATA	CORDULEGASTER	sp			PRD	N	1	3	-	-	-	-	-		-	
06.06.007.00	ODONATA	LANTHUS	sp			PRD	N	2	5	-	-	-	-	-		-	
07.02.001.00	MEGALOPTERA	SIALIS	sp			PRD	N	3	6	-	-	-	-	-		-	
13.02.002.00	BIVALVIA	PISIDIUM	sp			CF	N	4	8	-	-	-	-	-		-	
18.04.000.00	OLIGOCHAETA	LUMBRICULIDAE	unid	6	23	CG	N	-	-	-	-	-	-	1		1	
18.06.000.00	OLIGOCHAETA	LUMBRICINA	unid			CG	N	-	-	-	-	-	-	-		-	
			TOTAL # of Organisms:	354	386				Total BI Score	313	338	563	574	Total Richness	Total EPT-R	Total Richness	Total EPT-R
									Total # Organisms	354	386	354	386				
									# of Organisms w/o BI	6	23	6	23	31		34	
									Total # Organisms with BI	348	363	348	363		17		21
									Biotic Index	0.90	0.93	1.62	1.58				

Major Taxonomic Group Statistics

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-1A
Sample Date 09/18/09

Key	KN-1: Numbers of Organisms										
	COLEOPTERA	DIPTERA	EPHEMEROPTERA	TRICHOPTERA	PLECOPTERA	OLIGOCHAETA	BIVALVIA	MEGALOPTERA	ODONATA	OTHER	TOTAL
02.03.003.00	0	0	0	0	0	0	0	0	0	0	
02.05.005.00	0	1	0	0	0	0	0	0	0	0	
02.05.008.00	0	0	0	0	0	0	0	0	0	0	
02.05.017.00	0	4	0	0	0	0	0	0	0	0	
02.05.018.00	0	0	0	0	0	0	0	0	0	0	
02.05.068.00	0	0	0	0	0	0	0	0	0	0	
02.05.075.00	0	19	0	0	0	0	0	0	0	0	
02.05.076.00	0	4	0	0	0	0	0	0	0	0	
02.05.085.05	0	0	0	0	0	0	0	0	0	0	
02.05.096.00	0	1	0	0	0	0	0	0	0	0	
02.05.110.00	0	4	0	0	0	0	0	0	0	0	
02.05.114.02	0	14	0	0	0	0	0	0	0	0	
02.05.121.00	0	1	0	0	0	0	0	0	0	0	
02.06.001.00	0	2	0	0	0	0	0	0	0	0	
02.14.004.00	0	1	0	0	0	0	0	0	0	0	
02.19.003.00	0	2	0	0	0	0	0	0	0	0	
02.19.006.00	0	5	0	0	0	0	0	0	0	0	
02.19.016.00	0	10	0	0	0	0	0	0	0	0	
02.19.019.00	0	0	0	0	0	0	0	0	0	0	
03.01.001.03	0	0	0	0	0	0	0	0	0	0	
03.01.001.09	0	0	6	0	0	0	0	0	0	0	
03.01.006.93	0	0	5	0	0	0	0	0	0	0	
03.04.005.02	0	0	0	0	0	0	0	0	0	0	
03.06.003.00	0	0	5	0	0	0	0	0	0	0	
03.06.007.00	0	0	0	0	0	0	0	0	0	0	
03.07.005.00	0	0	1	0	0	0	0	0	0	0	
04.01.003.00	0	0	0	1	0	0	0	0	0	0	
04.03.002.00	0	0	0	0	0	0	0	0	0	0	
04.05.006.00	0	0	0	14	0	0	0	0	0	0	
04.05.008.04	0	0	0	12	0	0	0	0	0	0	
04.05.008.07	0	0	0	20	0	0	0	0	0	0	
04.05.008.09	0	0	0	5	0	0	0	0	0	0	
04.07.001.00	0	0	0	6	0	0	0	0	0	0	
04.11.001.00	0	0	0	1	0	0	0	0	0	0	
04.12.002.00	0	0	0	0	0	0	0	0	0	0	
04.16.001.01	0	0	0	11	0	0	0	0	0	0	
04.16.001.03	0	0	0	0	0	0	0	0	0	0	
04.16.001.12	0	0	0	0	0	0	0	0	0	0	
04.14.005.00	0	0	0	0	0	0	0	0	0	0	
04.20.001.00	0	0	0	0	0	0	0	0	0	0	
05.01.000.01	0	0	0	0	1	0	0	0	0	0	
05.02.000.01	0	0	0	0	90	0	0	0	0	0	
05.03.000.01	0	0	0	0	77	0	0	0	0	0	
05.04.002.00	0	0	0	0	0	0	0	0	0	0	
05.05.001.00	0	0	0	0	6	0	0	0	0	0	
05.07.006.00	0	0	0	0	0	0	0	0	0	0	
05.07.006.91	0	0	0	0	0	0	0	0	0	0	
05.07.007.00	0	0	0	0	19	0	0	0	0	0	
05.08.001.02	0	0	0	0	0	0	0	0	0	0	
06.04.001.00	0	0	0	0	0	0	0	0	0	0	
06.06.007.00	0	0	0	0	0	0	0	0	0	0	
07.02.001.00	0	0	0	0	0	0	0	0	0	0	
13.02.002.00	0	0	0	0	0	0	0	0	0	0	
18.04.000.00	0	0	0	0	0	6	0	0	0	0	
18.06.000.00	0	0	0	0	0	0	0	0	0	0	
Total	**0**	**68**	**17**	**70**	**193**	**6**	**0**	**0**	**0**	**0**	**354**
Percent	**0.00%**	**19.2%**	**4.80%**	**19.8%**	**54.5%**	**1.69%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**100%**

Major Taxonomic Group Statistics

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-1A
Sample Date 09/18/09

Key	KN-2: Numbers of Organisms										
	COLEOPTERA	DIPTERA	EPHEMEROPTERA	TRICHOPTERA	PLECOPTERA	OLIGOCHAETA	BIVALVIA	MEGALOPTERA	ODONATA	OTHER	TOTAL
02.03.003.00	0	0	0	0	0	0	0	0	0	0	
02.05.005.00	0	8	0	0	0	0	0	0	0	0	
02.05.008.00	0	0	0	0	0	0	0	0	0	0	
02.05.017.00	0	2	0	0	0	0	0	0	0	0	
02.05.018.00	0	0	0	0	0	0	0	0	0	0	
02.05.068.00	0	0	0	0	0	0	0	0	0	0	
02.05.075.00	0	19	0	0	0	0	0	0	0	0	
02.05.076.00	0	10	0	0	0	0	0	0	0	0	
02.05.085.05	0	1	0	0	0	0	0	0	0	0	
02.05.096.00	0	1	0	0	0	0	0	0	0	0	
02.05.110.00	0	1	0	0	0	0	0	0	0	0	
02.05.114.02	0	22	0	0	0	0	0	0	0	0	
02.05.121.00	0	0	0	0	0	0	0	0	0	0	
02.06.001.00	0	1	0	0	0	0	0	0	0	0	
02.14.004.00	0	0	0	0	0	0	0	0	0	0	
02.19.003.00	0	1	0	0	0	0	0	0	0	0	
02.19.006.00	0	6	0	0	0	0	0	0	0	0	
02.19.016.00	0	1	0	0	0	0	0	0	0	0	
02.19.019.00	0	0	0	0	0	0	0	0	0	0	
03.01.001.03	0	0	0	0	0	0	0	0	0	0	
03.01.001.09	0	0	5	0	0	0	0	0	0	0	
03.01.006.93	0	0	1	0	0	0	0	0	0	0	
03.04.005.02	0	0	1	0	0	0	0	0	0	0	
03.06.003.00	0	0	0	0	0	0	0	0	0	0	
03.06.007.00	0	0	0	0	0	0	0	0	0	0	
03.07.005.00	0	0	2	0	0	0	0	0	0	0	
04.01.003.00	0	0	0	4	0	0	0	0	0	0	
04.03.002.00	0	0	0	1	0	0	0	0	0	0	
04.05.006.00	0	0	0	14	0	0	0	0	0	0	
04.05.008.04	0	0	0	19	0	0	0	0	0	0	
04.05.008.07	0	0	0	18	0	0	0	0	0	0	
04.05.008.09	0	0	0	5	0	0	0	0	0	0	
04.07.001.00	0	0	0	13	0	0	0	0	0	0	
04.11.001.00	0	0	0	0	0	0	0	0	0	0	
04.12.002.00	0	0	0	1	0	0	0	0	0	0	
04.16.001.01	0	0	0	6	0	0	0	0	0	0	
04.16.001.03	0	0	0	0	0	0	0	0	0	0	
04.16.001.12	0	0	0	1	0	0	0	0	0	0	
04.14.005.00	0	0	0	0	0	0	0	0	0	0	
04.20.001.00	0	0	0	0	0	0	0	0	0	0	
05.01.000.01	0	0	0	0	1	0	0	0	0	0	
05.02.000.01	0	0	0	0	84	0	0	0	0	0	
05.03.000.01	0	0	0	0	78	0	0	0	0	0	
05.04.002.00	0	0	0	0	1	0	0	0	0	0	
05.05.001.00	0	0	0	0	10	0	0	0	0	0	
05.07.006.00	0	0	0	0	0	0	0	0	0	0	
05.07.006.91	0	0	0	0	0	0	0	0	0	0	
05.07.007.00	0	0	0	0	23	0	0	0	0	0	
05.08.001.02	0	0	0	0	2	0	0	0	0	0	
06.04.001.00	0	0	0	0	0	0	0	0	0	0	
06.06.007.00	0	0	0	0	0	0	0	0	0	0	
07.02.001.00	0	0	0	0	0	0	0	0	0	0	
13.02.002.00	0	0	0	0	0	0	0	0	0	0	
18.04.000.00	0	0	0	0	0	23	0	0	0	0	
18.06.000.00	0	0	0	0	0	0	0	0	0	0	
Total	**0**	**73**	**9**	**82**	**199**	**23**	**0**	**0**	**0**	**0**	**386**
Percent	**0.00%**	**18.9%**	**2.33%**	**21.2%**	**51.6%**	**5.96%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**100%**

Functional Feeding Group Analysis

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-1A
Sample Date 09/18/09

Key	KN-1: Numbers of Organisms								KN-2: Numbers of Organisms							
	CG	CF	PRD	SRD	SHR	SCR	No FG Designation	Total	CG	CF	PRD	SRD	SHR	SCR	No FG Designation	Total
02.03.003.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.05.005.00	0	0	0	1	0	0	0		0	0	0	8	0	0	0	
02.05.008.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.05.017.00	4	0	0	0	0	0	0		2	0	0	0	0	0	0	
02.05.018.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.05.068.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.05.075.00	19	0	0	0	0	0	0		19	0	0	0	0	0	0	
02.05.076.00	4	0	0	0	0	0	0		10	0	0	0	0	0	0	
02.05.085.05	0	0	0	0	0	0	0		1	0	0	0	0	0	0	
02.05.096.00	1	0	0	0	0	0	0		1	0	0	0	0	0	0	
02.05.110.00	0	0	4	0	0	0	0		0	0	1	0	0	0	0	
02.05.114.02	14	0	0	0	0	0	0		22	0	0	0	0	0	0	
02.05.121.00	1	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.06.001.00	2	0	0	0	0	0	0		1	0	0	0	0	0	0	
02.14.004.00	0	1	0	0	0	0	0		0	0	0	0	0	0	0	
02.19.003.00	0	0	2	0	0	0	0		0	0	1	0	0	0	0	
02.19.006.00	0	0	5	0	0	0	0		0	0	6	0	0	0	0	
02.19.016.00	0	0	0	10	0	0	0		0	0	0	1	0	0	0	
02.19.019.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
03.01.001.03	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
03.01.001.09	6	0	0	0	0	0	0		5	0	0	0	0	0	0	
03.01.006.93	0	0	0	0	0	5	0		0	0	0	0	0	1	0	
03.04.005.02	0	0	0	0	0	0	0		0	0	0	0	1	0	0	
03.06.003.00	5	0	0	0	0	0	0		0	0	0	0	0	0	0	
03.06.007.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
03.07.005.00	1	0	0	0	0	0	0		2	0	0	0	0	0	0	
04.01.003.00	0	0	0	0	1	0	0		0	0	0	0	4	0	0	
04.03.002.00	0	0	0	0	0	0	0		0	0	0	0	0	1	0	
04.05.006.00	0	14	0	0	0	0	0		0	14	0	0	0	0	0	
04.05.008.04	0	12	0	0	0	0	0		0	19	0	0	0	0	0	
04.05.008.07	0	20	0	0	0	0	0		0	18	0	0	0	0	0	
04.05.008.09	0	5	0	0	0	0	0		0	5	0	0	0	0	0	
04.07.001.00	0	0	0	6	0	0	0		0	0	0	13	0	0	0	
04.11.001.00	0	0	0	0	0	1	0		0	0	0	0	0	0	0	
04.12.002.00	0	0	0	0	0	0	0		0	1	0	0	0	0	0	
04.16.001.01	0	0	11	0	0	0	0		0	0	6	0	0	0	0	
04.16.001.03	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
04.16.001.12	0	0	0	0	0	0	0		0	0	1	0	0	0	0	
04.14.005.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
04.20.001.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
05.01.000.01	0	0	0	1	0	0	0		0	0	0	1	0	0	0	
05.02.000.01	0	0	90	0	0	0	0		0	0	84	0	0	0	0	
05.03.000.01	0	0	0	77	0	0	0		0	0	0	78	0	0	0	
05.04.002.00	0	0	0	0	0	0	0		0	0	0	1	0	0	0	
05.05.001.00	0	0	0	6	0	0	0		0	0	0	10	0	0	0	
05.07.006.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
05.07.006.91	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
05.07.007.00	0	0	19	0	0	0	0		0	0	23	0	0	0	0	
05.08.001.02	0	0	0	0	0	0	0		0	0	0	2	0	0	0	
06.04.001.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
06.06.007.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
07.02.001.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
13.02.002.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
18.04.000.00	6	0	0	0	0	0	0		23	0	0	0	0	0	0	
18.06.000.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
Total	**63**	**52**	**131**	**101**	**1**	**6**	**0**	**354**	**86**	**57**	**122**	**114**	**5**	**2**	**0**	**386**
Percent	**17.8%**	**14.7%**	**37.0%**	**28.5%**	**0.28%**	**1.69%**	**0.00%**	**100%**	**22.3%**	**14.8%**	**31.6%**	**29.5%**	**1.30%**	**0.52%**	**0.00%**	**100%**

Functional Feeding Group Analysis

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-1A
Sample Date 09/18/09

	Model			Kicknet 1 vs. SHG		Kicknet 2 vs. SHG	
	SHG	MHG	WWMG	KN-1	PPCS	KN-2	PPCS
Col. Gath.	31%	32%	22%	17.8%	57.4%	22.3%	71.9%
Col. Filt.	18%	30%	36%	14.7%	81.6%	14.8%	82.0%
Predator	19%	13%	7%	37.0%	51.3%	31.6%	60.1%
Shred-Det.	15%	4%	2%	28.5%	52.6%	29.5%	50.8%
Shred- Herb.	1%	1%	5%	0.28%	28.2%	1.30%	77.2%
Scraper	12%	13%	22%	1.69%	14.1%	0.52%	4.32%
				PPCS-FG =	47.6%	PPCS-FG =	57.7%

CG = Collector/Gatherer

CF = Collector/Filterer

PRD = Predator

SRD = Shredder - Detritus

SHR = Shredder - Herbivore

SCR = Scraper

Percent Model Affinity of Orders (PMA-O) Calculations

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook **Class** Small, High Gradient, B2-3
Location BU-1A
Sample Date 09/18/09 **Sampler** Cathy Szal

Order	Model			Kicknet 1 vs. Model (SHG)		Kicknet 2 vs. Model (SHG)	
	SHG	MHG	WWMG	%	difference	%	difference
Coleoptera	8%	6%	13%	0.00%	8.00	0.00%	8.00
Diptera	19%	18%	13%	19.2%	0.209	18.9%	0.088
Ephemeroptera	23%	34%	32%	4.80%	18.2	2.33%	20.7
Plecoptera	21%	8%	8%	54.5%	33.5	51.6%	30.6
Trichoptera	28%	33%	33%	19.8%	8.23	21.2%	6.76
Oligochaeta	0.5%	0.5%	1.0%	1.69%	1.19	5.96%	5.46
Other	0.5%	0.5%	1.0%	0.00%	0.500	0.00%	0.500
				Sum diff	69.8		72.0
				Sum diff * 0.5	34.9		36.0
				100-(sum diff * 0.5)	65.1		64.0
				% model affinity	**65.1%**		**64.0%**

EPT / EPT+C Calculations

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-1A
Sample Date 09/18/09
Class Small, High Gradient, B2-3
Sampler Cathy Szal

	KN-1	KN-2
#EPT organisms	280	290
#C organisms	48	64
EPT/EPT+C	0.85	0.82

Biometric Summary

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook **Class** Small, High Gradient, B2-3
Location BU-1A
Sample Date 09/18/09 **Sampler** Cathy Szal

Replicate # Sampling Method	1 KN	2 KN	Average KN
Biometrics:			
Density/Unit	354	386	370
Species Richness	31.0	34.0	32.5
EPT Richness	17.0	21.0	19.0
Old Bio Index (0 to 5)	0.899	0.931	0.915
New Bio Index (0 to 10)	1.62	1.58	1.60
% dominant taxa	25.4%	21.8%	23.6%
EPT/EPT+C	0.854	0.819	0.836
EPT/Richness	0.548	0.618	0.585
% Model Affinity (orders)	65.1%	64.0%	64.5%
PPCS - functional groups	47.6%	57.7%	52.6%
Major Groups:			
Coleoptera (%)	0.00%	0.00%	0.00%
Diptera (%)	19.2%	18.9%	19.1%
Ephemeroptera (%)	4.80%	2.33%	3.57%
Trichoptera (%)	19.8%	21.2%	20.5%
Plecoptera (%)	54.5%	51.6%	53.0%
Oligochaeta (%)	1.69%	5.96%	3.83%
Bivalvia (%)	0.00%	0.00%	0.00%
Megaloptera (%)	0.00%	0.00%	0.00%
Odonata (%)	0.00%	0.00%	0.00%
Other (%)	0.00%	0.00%	0.00%
Total (%)	100%	100%	100%
Feeding Groups:			
Collector Gatherer (%)	17.8%	22.3%	20.0%
Collector Filterer (%)	14.7%	14.8%	14.7%
Predator (%)	37.0%	31.6%	34.3%
Shredder - Detritus (%)	28.5%	29.5%	29.0%
Shredder - Herbivore (%)	0.28%	1.30%	0.79%
Scraper (%)	1.69%	0.52%	1.11%
No FG Designation (%)	0.00%	0.00%	0.00%
Total (%)	100%	100%	100%

Prepared By VHB Pioneer
Project MWT Summer Biomonitoring
Station Upstream **Latitude** 44°8'18.1"N
Stream Rice Brook **Longitude** 72°53'25.81"W
Location BU-1A **Class** Small, High Gradient, B2-3
Sample Date 09/18/09 **Sampler** Cathy Szal

APPLICATION OF STATE OF VERMONT DEC BIOCRITERIA (2/10/04)

Metric	Value	Metric Scoring Results Based on DEC Thresholds for SHG Streams					
		Class B2-3		Class B1		Class A	
		Threshold	Outcome	Threshold	Outcome	Threshold	Outcome
Density	370	≥300	Pass	≥400	I-	≥500	Fail
Richness	32.5	≥27	Pass	≥31	Pass	≥35	Fail
EPT	19.0	≥16	Pass	≥19	I+	≥21	Fail
% PMA-O	64.5%	≥45%	Pass	≥55%	Pass	≥65%	I-
BI (New 1-10)	1.60	≤4.50	Pass	≤3.50	Pass	≤3.00	Pass
% Oligo	3.83%	≤12%	Pass	≤5	I+	≤2	Fail
EPT/EPT+C	0.836	≥0.45	Pass	≥0.55	Pass	≥0.65	Pass
% PPCS-FG	52.6%	≥ 40%	Pass	≥ 45%	Pass	≥ 50%	I+
Outcome:		**Biocriteria are met**					
The following metrics do not meet Class B2-3 thresholds:		NA					

Individual Metric Outcome Guidelines (using the table below)
1) A metric is scored "pass" when the result meets the full support requirements
2) A metric is scored "I+" when the result is between the threshold level and the full support level
3) A metric is scored "I-" when the result is between the threshold level and the non-support level
4) A metric is scored "Fail" when the result is below the non-support requirements

Overall Outcome Guidelines
1) Biocriteria are "met" when: a) five or more metrics are scored "pass" and no metrics have a score of "I-" or "Fail".
2) Biocriteria are "not met" when one or more metrics are scored "failed".
3) In situations where neither items 1 or 2 are the result, an "indeterminate" finding will be made

Scoring Guidelines - Wadeable Stream Category SHG

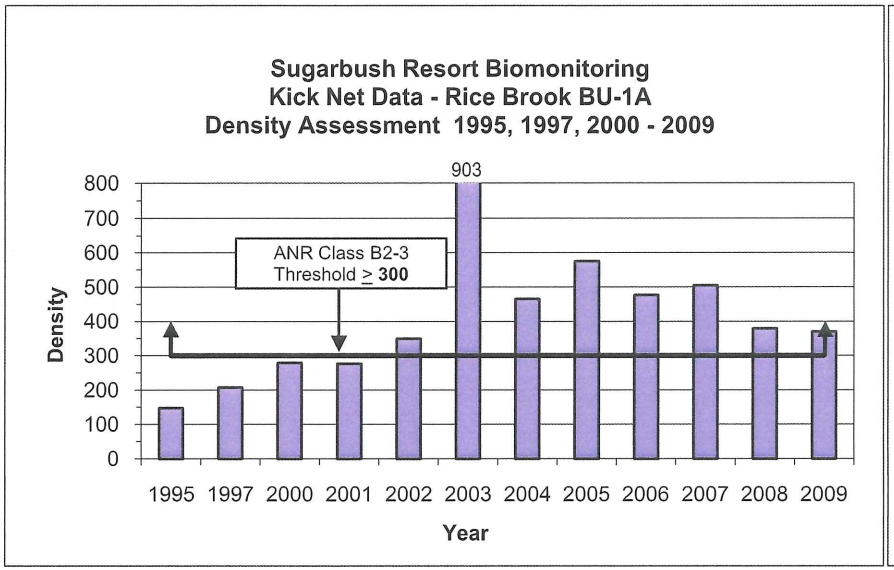
WQ Class	Score	Density	Richness	EPT	PMA-O	BI	% Oligo	EPT/ EPT+C	PPCS-F
A-1	Full Support	>605	>36	>22	>70%	<2.70	<1%	>0.67	>55%
	Threshold	≥500	≥35	≥21	≥65%	≤3	≤2%	≥0.65	≥50%
	Non-Support	<450	<34	<20	<60%	>3.30	>3%	<0.63	<45%
B1	Full Support	>450	>32	>20	>60%	<3.35	<3.5%	>0.57	>50%
	Threshold	≥400	≥31	≥19	≥55%	≤3.5	≤5%	≥0.55	≥45%
	Non-Support	<350	<30	<18	<50%	>3.65	>6.5%	<0.53	<40%
B2-3	Full Support	>350	>28	>17	>50%	<4.35	<9.5%	>0.47	>45%
	Threshold	≥300	≥27	≥16	≥45%	≤4.5	≤12%	≥0.45	≥40%
	Non-Support	<250	<26	<15	<40%	>4.65	>14.5%	<0.43	<35%

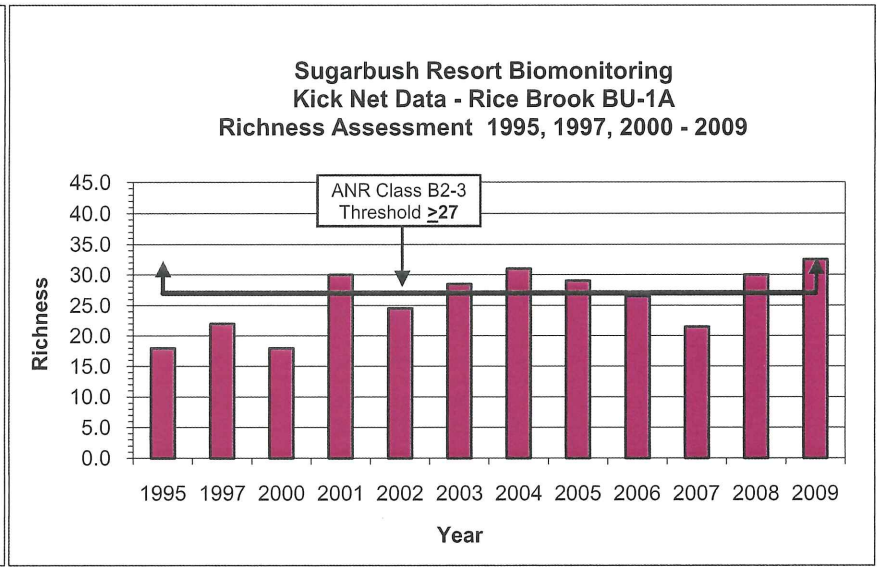
Sugarbush Resort Biomonitoring
Kick Net Data - Rice Brook BU-1A
Class B2-3

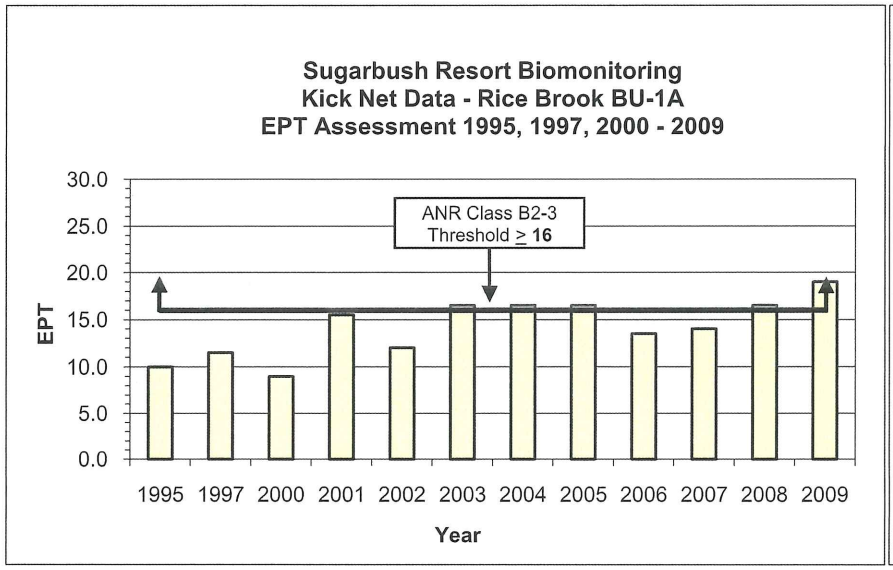
Year	Density	Richness	EPT	% PMA-O	BI	% Oligo.	EPT/EPT +C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥40	
1995	**148**	**18.0**	**10.0**	64.0	1.82	0.00	0.860	44.0	Biocriteria Not Met
1997	**207**	**22.0**	**11.5**	75.0	1.61	2.00	0.880	**37.0**	Biocriteria Not Met
2000	**279**	**18.0**	**9.00**	48.7	1.21	1.70	0.940	**31.0**	Biocriteria Not Met
2001	**276**	30.0	**15.5**	70.7	1.96	2.70	0.770	46.0	Indeterminate
2002	349	**24.5**	**12.0**	56.5	2.49	1.00	0.540	46.0	Biocriteria Not Met
2003	903	28.5	16.5	73.1	1.98	1.40	0.820	46.0	Biocriteria Met
2004	466	31.0	16.5	75.9	2.44	4.30	0.810	45.0	Biocriteria Met
2005	576	29.0	16.5	66.4	2.16	2.90	0.680	46.0	Biocriteria Met
2006	477	**26.5**	**13.5**	78.5	2.74	0.90	0.750	43.0	Biocriteria Not Met
2007	505	**21.5**	**14.0**	75.7	1.47	0.61	0.900	45.0	Biocriteria Not Met
2008	379	30.0	16.5	70.6	1.95	1.72	0.718	70.5	Biocriteria Met
2009	370	32.5	19.0	64.5	1.60	3.83	0.836	52.6	Biocriteria Met

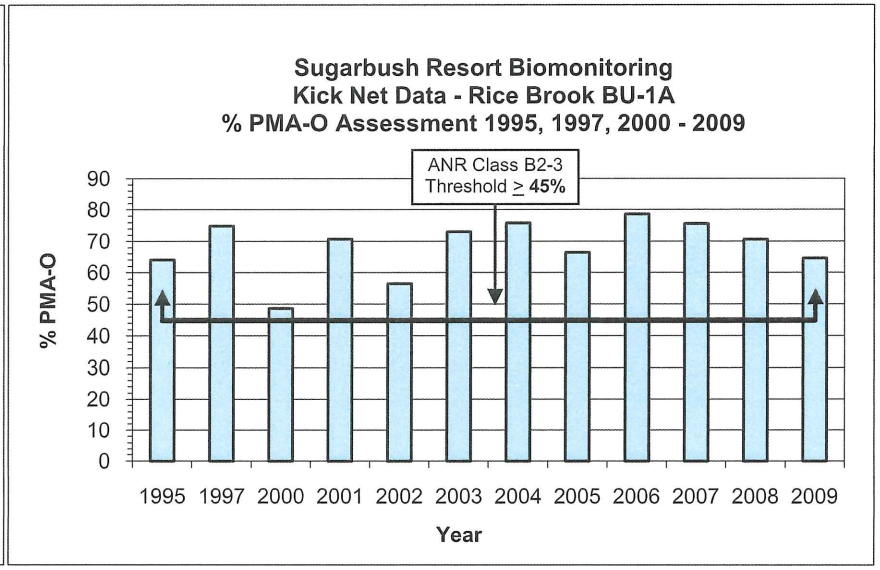
Bold/shade denotes metric did not meet Class B2-3 biocriteria threshold

Sugargush Resort Biomonitoring
Kick Net Data - Rice Brook BU-1A
Summary Metric Charts









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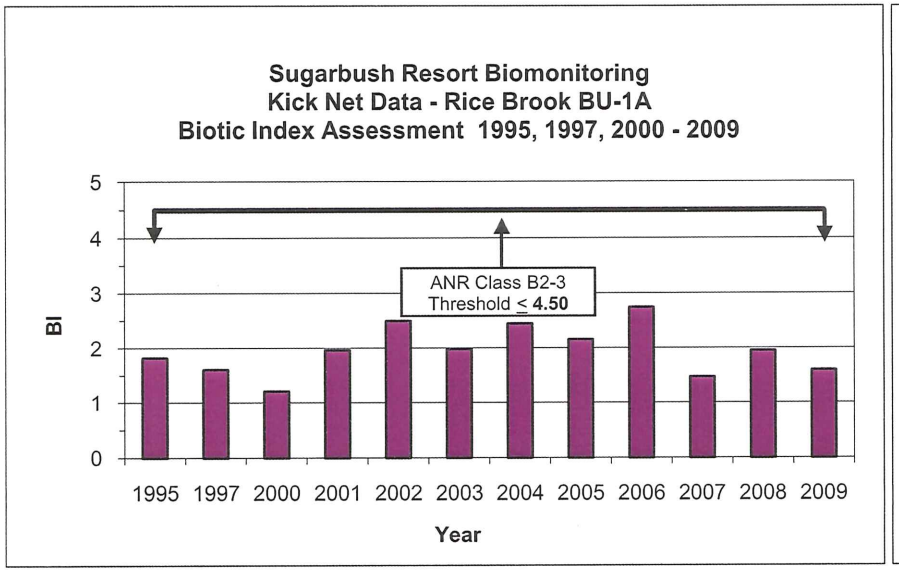
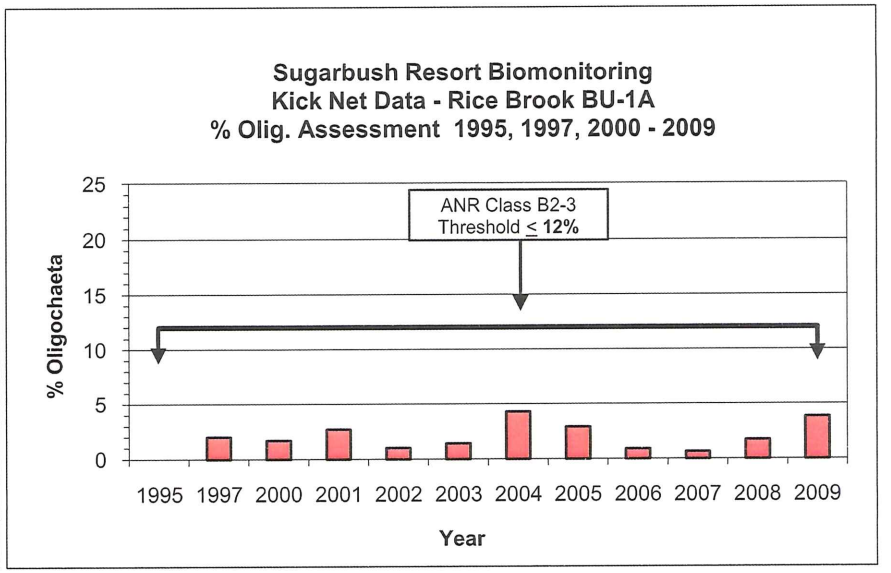
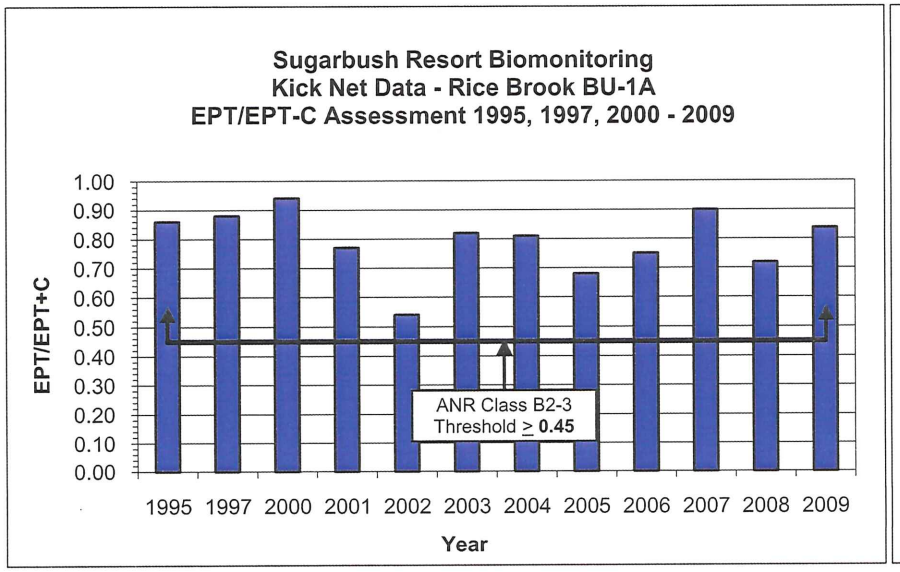
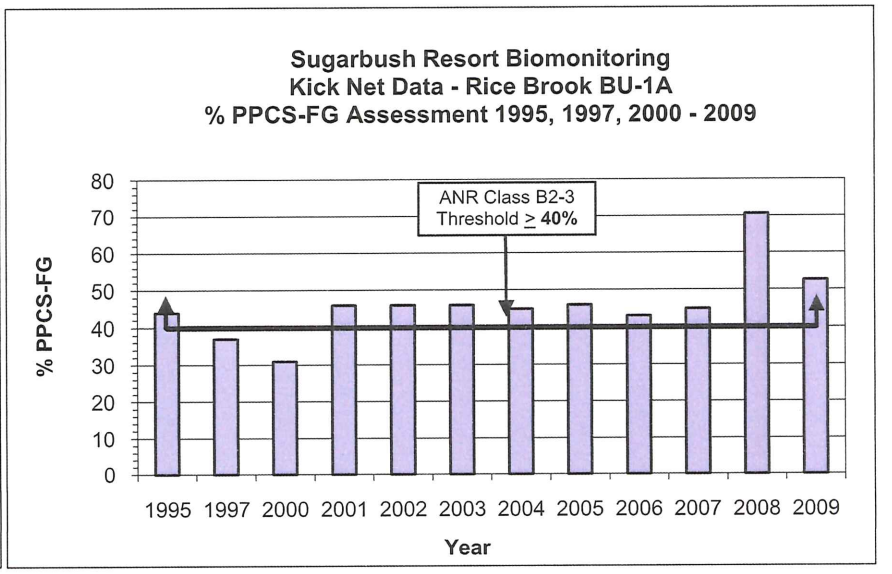
Sugargush Resort Biomonitoring
Kick Net Data - Rice Brook BU-1A
Summary Metric Charts









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LOTIC BENTHOS FIELD SHEET

Site Location:
River (site) ___Rice Brook___ River Mile ___ Site ID ___BU-1B___ BioLab ID ___
Town ___Warren___ Stream Order ___ Drainage Area ___ Km² Elevation __1475__ ft
Latitude ___ Longitude ___ Lat/Long source (GPS, USGS Map,Datum) ___
Site Description ___

Sampling Information:
Date __9/20/2009__ Time __14:45__ Personnel (circle sampler) ___Cathy Szal___ Gear __MAS and kick net__
Effort time (min) __2__ Area (m²) ___ Mesh (um) __590__ Quantitative : Y / N #Reps __2__ Comp/rep __4__
Weather ___sunny___ Flow/Weather Previous (2 weeks/2days) ___fairly quiet 2 weeks___
Baseflow ___, or Freshet flow ___ Rising / Receding ___ Present Flow: H - **M** - L

General observations circle those that apply: Overall Aesthetic Rating 0 (poor) – 5 (exc.)

A: Debris Obvious Pollution: Sludge, Sawdust, Paper Fiber, **Sand**, Silt, Sewage, Oily Sheen, Trash, **Iron**, Scum, None

B: Water Clarity **Clear**, Slightly Turbid, Moderately Turbid, Very Turbid, Secci Tube ___mm

C: Water Color **Clear**, Green, Milky, Brown (Tannic) L M H , Gray, Metallic, Reddish

D: Odors **None**, Musty, Fishy, Sewage, Manure, Sulfur(eggs), Oily/gas

Embeddedness: 0-5% Excel (5) **5-25% V Good (4)** 25-50% Good (3) 50-75% Fair (2) > 75% Poor (1) Estimate ___%
Silt rating (0-5) __3__ (0=none, 5= high) CPOM rating (leaf packs) (0-5): __2__ (0= none,5=high)
Snags/debris dams # __0__ / __100__ m (reach)

Bank Stability: EX, **G** , F , P ; **Riparian Width** (facing upstream) L __50__ ft, R __50__ ft

% Canopy: 100 **90** 80 70 60 50 40 30 20 10 0 Overhead = Open, Partly Open, or **Closed** *(See back for Densiometer form)*

Vegetation: (both sides) %: Overstory: Softwood __20__ Hardwood __80__
(Does not need to add up to 100%) %: Understory: Shrub(brush) __20__ Grass ___ Herbaceous __20__
Surrounding Land Use: __Residential, Ski Area, Forest__

Periphyton Cover: For each type 0-100% (*See back for Periphyton Cover Form*)
Diatom __70__ % Filamentous green ___% and length ___(in) Blue Green ___% Moss __trace__ % Green ___%
Other ___% General Trophic Rating (0-5) ___(0=oligo, 5=Eutroph)

General Water Type:
Riffle __✓__ Winder ___ Other ___ Warm ___ Cold __✓__ Mixed ___
B.F.Width __15-20__ (ft) Wetted Width __8-15__ (ft) Riffle Depth __2-6__ (in) Pool Depth __24__ (in) and Obs ___
Velocity (measured): ___ ft/sec, Velocity RANGE-estimate: ___ <0.4 ft/sec (S) __✓__ 0.4-2 ft/sec (M) ___ >2 ft/sec (F)
Channelized: Y / **N** Upstream Dam: Y ___mi / **N** Other modifications: __culverts__

Water Quality Parameters: Field (Record) or Collected (Circle), Meter (type, #) ___ Chemistry LabId ___
Temp Air __68__ °C,°F Water __11.5__ °C fpH ___ lab pH ___ fCond ___ labCond ___ *D.O.%* ___ D.Omg/l ___

Cond pH Alkalinity Color ___ *TSS TP DP Cl SO4 Turb TN N02-3 TNH3 DOC Ca Mg Na K Hardness Metals*
Other ___, ___, ___, ___, ___, ___, ___, ___, ___, ___
Field Sheet Complete: __CCS__ (initial) **Photo's:** ___ **Fish Survey Conducted (circle):** Y / **N**

Site Sketch & Observations

Aquatic Biota Observed: none

NOTES:

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook **Class** Small, High Gradient, B2-3
Location BU-1B
Sample Date 09/20/09 **Sampler** Cathy Szal

Taxonomic Data							Biotic Index				Richness Metrics	
							Biotic Index Scores		Old BI (1-5)	New BI (1-10)	Richness	EPT
Key	Order	Genus	Species	# Org's	FFG	Chiro	Old BI	New BI	KN-1	KN-1	KN-1	KN-1
02.03.003.00	DIPTERA	BEZZIA	sp	2	PRD	N	3	6	6	12	1	
02.05.005.00	DIPTERA	BRILLIA	sp	6	SRD	Y	3	5	18	30	1	
02.05.017.00	DIPTERA	CORYNONEURA	sp	6	CG	Y	2	4	12	24	1	
02.05.075.00	DIPTERA	PARAMETRIOCNEMUS	sp	36	CG	Y	3	5	108	180	1	
02.05.110.00	DIPTERA	THIENEMANNEMYIA	sp	5	PRD	Y	3	6	15	30	1	
02.05.114.02	DIPTERA	TVETENIA	bavarica	25	CG	Y	2	4	50	100	1	
02.05.121.00	DIPTERA	MICROPSECTRA	sp	5	CG	Y	3	6	15	30	1	
02.06.001.00	DIPTERA	DIXA	sp	5	CG	N	2	1	10	5	1	
02.14.004.00	DIPTERA	PROSIMULIUM	sp	5	CF	N	1	2	5	10	1	
02.19.001.00	DIPTERA	ANTOCHA	sp	1	CG	N	3	3	3	3	1	
02.19.003.00	DIPTERA	DICRANOTA	sp	18	PRD	N	2	3	36	54	1	
02.19.006.00	DIPTERA	HEXATOMA	sp	7	PRD	N	2	2	14	14	1	
03.01.001.09	EPHEMEROPTERA	BAETIS	tricaudatus	4	CG	N	3	6	12	24	1	1
03.01.006.93	EPHEMEROPTERA	ACENTRELLAPLAUDITUS	sp	1	SCR	N	2	4	2	4	1	1
03.04.005.02	EPHEMEROPTERA	EURYLOPHELLA	funeralis		SHR	N	1	0	-	-	-	0
03.06.003.00	EPHEMEROPTERA	EPEORUS	sp	5	CG	N	0	0	0	0	1	1
03.06.007.91	EPHEMEROPTERA	STENONEMA	sp a	1	SCR	N	2	3	2	3	1	1
03.07.005.00	EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	2	CG	N	2	1	4	2	1	1
04.05.006.00	TRICHOPTERA	PARAPSYCHE	sp	5	CF	N	0	0	0	0	1	1
04.05.008.04	TRICHOPTERA	SYMPHITOPSYCHE	alhedra	10	CF	N	2	3	20	30	1	1
04.05.008.06	TRICHOPTERA	SYMPHITOPSYCHE	slossonae	5	CF	N	2	4	10	20	1	1
04.05.008.07	TRICHOPTERA	SYMPHITOPSYCHE	sparna	2	CF	N	2	4	4	8	1	1
04.05.008.09	TRICHOPTERA	SYMPHITOPSYCHE	ventura	10	CF	N	1	3	10	30	1	1
04.07.001.00	TRICHOPTERA	LEPIDOSTOMA	sp	17	SRD	N	1	1	17	17	1	1
04.11.001.00	TRICHOPTERA	PSILOTRETA	sp	2	SCR	N	0	0	0	0	1	1
04.12.002.00	TRICHOPTERA	DOLOPHILODES	sp	10	CF	N	0	0	0	0	1	1
04.16.001.01	TRICHOPTERA	RHYACOPHILA	fuscula	5	PRD	N	1	2	5	10	1	1
04.16.001.03	TRICHOPTERA	RHYACOPHILA	carolina	2	PRD	N	0	0	0	0	1	1
04.16.001.12	TRICHOPTERA	RHYACOPHILA	invaria	1	PRD	N	1	1	1	1	1	1
04.14.005.00	TRICHOPTERA	POLYCENTROPUS	sp	1	PRD	N	3	6	3	6	1	1
05.01.000.01	PLECOPTERA	CAPNIIDAE	imm		SRD	N	1	3	-	-	-	0
05.02.000.01	PLECOPTERA	CHLOROPERLIDAE	imm	55	PRD	N	0	0	0	0	1	1
05.03.000.01	PLECOPTERA	LEUCTRIDAE	imm	72	SRD	N	0	0	0	0	1	1
05.05.001.00	PLECOPTERA	PELTOPERLA	sp	10	SRD	N	1	0	10	0	1	1
05.07.007.00	PLECOPTERA	MALIREKUS	sp	6	PRD	N	1	2	6	12	1	1
05.08.001.02	PLECOPTERA	PTERONARCYS	proteus		SRD	N	1	0	-	-	-	0
06.01.004.00	ODONATA	BOYERIA	sp	1	PRD	N	2	2	2	2	1	
06.04.001.00	ODONATA	CORDULEGASTER	sp	1	PRD	N	1	3	1	3	1	
18.04.000.00	OLIGOCHAETA	LUMBRICULIDAE	unid	12	CG	N	-	-	-	-	1	
18.05.000.00	OLIGOCHAETA	ENCHYTRAEIDAE	unid	1	CG	N	-	-	-	-	1	
			TOTAL # of Organisms:	**362**				**Total BI Score**	401	664	**Total Richness**	**Total EPT-R**
								Total # Organisms	362	362		
								# of Organisms w/o BI	13	13	37	
								Total # Organisms with BI	349	349		21
								Biotic Index	1.15	1.90		

Major Taxonomic Group Statistics

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-1B
Sample Date 09/20/09

Key	KN-1: Numbers of Organisms									
	COLEOPTERA	DIPTERA	EPHEMEROPTERA	TRICHOPTERA	PLECOPTERA	OLIGOCHAETA	BIVALVIA	MEGALOPTERA	ODONATA	TOTAL
02.03.003.00	0	2	0	0	0	0	0	0	0	
02.05.005.00	0	6	0	0	0	0	0	0	0	
02.05.017.00	0	6	0	0	0	0	0	0	0	
02.05.075.00	0	36	0	0	0	0	0	0	0	
02.05.110.00	0	5	0	0	0	0	0	0	0	
02.05.114.02	0	25	0	0	0	0	0	0	0	
02.05.121.00	0	5	0	0	0	0	0	0	0	
02.06.001.00	0	5	0	0	0	0	0	0	0	
02.14.004.00	0	5	0	0	0	0	0	0	0	
02.19.001.00	0	1	0	0	0	0	0	0	0	
02.19.003.00	0	18	0	0	0	0	0	0	0	
02.19.006.00	0	7	0	0	0	0	0	0	0	
03.01.001.09	0	0	4	0	0	0	0	0	0	
03.01.006.93	0	0	1	0	0	0	0	0	0	
03.04.005.02	0	0	0	0	0	0	0	0	0	
03.06.003.00	0	0	5	0	0	0	0	0	0	
03.06.007.91	0	0	1	0	0	0	0	0	0	
03.07.005.00	0	0	2	0	0	0	0	0	0	
04.05.006.00	0	0	0	5	0	0	0	0	0	
04.05.008.04	0	0	0	10	0	0	0	0	0	
04.05.008.06	0	0	0	5	0	0	0	0	0	
04.05.008.07	0	0	0	2	0	0	0	0	0	
04.05.008.09	0	0	0	10	0	0	0	0	0	
04.07.001.00	0	0	0	17	0	0	0	0	0	
04.11.001.00	0	0	0	2	0	0	0	0	0	
04.12.002.00	0	0	0	10	0	0	0	0	0	
04.16.001.01	0	0	0	5	0	0	0	0	0	
04.16.001.03	0	0	0	2	0	0	0	0	0	
04.16.001.12	0	0	0	1	0	0	0	0	0	
04.14.005.00	0	0	0	1	0	0	0	0	0	
05.01.000.01	0	0	0	0	0	0	0	0	0	
05.02.000.01	0	0	0	0	55	0	0	0	0	
05.03.000.01	0	0	0	0	72	0	0	0	0	
05.05.001.00	0	0	0	0	10	0	0	0	0	
05.07.007.00	0	0	0	0	6	0	0	0	0	
05.08.001.02	0	0	0	0	0	0	0	0	0	
06.01.004.00	0	0	0	0	0	0	0	0	1	
06.04.001.00	0	0	0	0	0	0	0	0	1	
18.04.000.00	0	0	0	0	0	12	0	0	0	
18.05.000.00	0	0	0	0	0	1	0	0	0	
Total	**0**	**121**	**13**	**70**	**143**	**13**	**0**	**0**	**2**	**362**
Percent	**0.00%**	**33.4%**	**3.59%**	**19.3%**	**39.5%**	**3.59%**	**0.00%**	**0.00%**	**0.55%**	**100%**

Functional Feeding Group Analysis

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-1B
Sample Date 09/20/09

Key	KN-1: Numbers of Organisms						
	CG	CF	PRD	SRD	SHR	SCR	Total
02.03.003.00	0	0	2	0	0	0	
02.05.005.00	0	0	0	6	0	0	
02.05.017.00	6	0	0	0	0	0	
02.05.075.00	36	0	0	0	0	0	
02.05.110.00	0	0	5	0	0	0	
02.05.114.02	25	0	0	0	0	0	
02.05.121.00	5	0	0	0	0	0	
02.06.001.00	5	0	0	0	0	0	
02.14.004.00	0	5	0	0	0	0	
02.19.001.00	1	0	0	0	0	0	
02.19.003.00	0	0	18	0	0	0	
02.19.006.00	0	0	7	0	0	0	
03.01.001.09	4	0	0	0	0	0	
03.01.006.93	0	0	0	0	0	1	
03.04.005.02	0	0	0	0	0	0	
03.06.003.00	5	0	0	0	0	0	
03.06.007.91	0	0	0	0	0	1	
03.07.005.00	2	0	0	0	0	0	
04.05.006.00	0	5	0	0	0	0	
04.05.008.04	0	10	0	0	0	0	
04.05.008.06	0	5	0	0	0	0	
04.05.008.07	0	2	0	0	0	0	
04.05.008.09	0	10	0	0	0	0	
04.07.001.00	0	0	0	17	0	0	
04.11.001.00	0	0	0	0	0	2	
04.12.002.00	0	10	0	0	0	0	
04.16.001.01	0	0	5	0	0	0	
04.16.001.03	0	0	2	0	0	0	
04.16.001.12	0	0	1	0	0	0	
04.14.005.00	0	0	1	0	0	0	
05.01.000.01	0	0	0	0	0	0	
05.02.000.01	0	0	55	0	0	0	
05.03.000.01	0	0	0	72	0	0	
05.05.001.00	0	0	0	10	0	0	
05.07.007.00	0	0	6	0	0	0	
05.08.001.02	0	0	0	0	0	0	
06.01.004.00	0	0	1	0	0	0	
06.04.001.00	0	0	1	0	0	0	
18.04.000.00	12	0	0	0	0	0	
18.05.000.00	1	0	0	0	0	0	
Total	**102**	**47**	**104**	**105**	**0**	**4**	**362**
Percent	**28.2%**	**13.0%**	**28.7%**	**29.0%**	**0.00%**	**1.10%**	**100%**

Functional Feeding Group Analysis

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-1B
Sample Date 09/20/09

	Model			Kicknet 1 vs. SHG	
	SHG	**MHG**	**WWMG**	**KN-1**	**PPCS**
Col. Gath.	31%	32%	22%	28.2%	90.9%
Col. Filt.	18%	30%	36%	13.0%	72.1%
Predator	19%	13%	7%	28.7%	66.1%
Shred-Det.	15%	4%	2%	29.0%	51.7%
Shred- Herb.	1%	1%	5%	0.00%	0.00%
Scraper	12%	13%	22%	1.10%	9.21%
				PPCS-FG =	**48.3%**

CG = Collector/Gatherer

CF = Collector/Filterer

PRD = Predator

SRD = Shredder - Detritus

SHR = Shredder - Herbivore

SCR = Scraper

Percent Model Affinity of Orders (PMA-O) Calculations

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-1B **Class** Small, High Gradient, B2-3
Sample Date 09/20/09 **Sampler** Cathy Szal

Order	Model			Kicknet 1 vs. Model (SHG)	
	SHG	MHG	WWMG	%	difference
Coleoptera	8%	6%	13%	0.00%	8.00
Diptera	19%	18%	13%	33.4%	14.4
Ephemeroptera	23%	34%	32%	3.59%	19.4
Plecoptera	21%	8%	8%	39.5%	18.5
Trichoptera	28%	33%	33%	19.3%	8.66
Oligochaeta	0.5%	0.5%	1.0%	3.59%	3.09
Other	0.5%	0.5%	1.0%	0.55%	0.052
				Sum diff	72.1
				Sum diff * 0.5	36.1
				100-(sum diff * 0.5)	63.9
				% model affinity	**63.9%**

EPT / EPT+C Calculations

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-1B
Sample Date 09/20/09
Class Small, High Gradient, B2-3
Sampler Cathy Szal

	KN-1
#EPT organisms	226
#C organisms	83
EPT/EPT+C	0.731

Biometric Summary

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BU-1B **Class** Small, High Gradient, B2-3
Sample Date 09/20/09 **Sampler** Cathy Szal

Replicate # Sampling Method	1 KN	Average KN
Biometrics:		
Density/Unit	362	362
Species Richness	37.0	37.0
EPT Richness	21.0	21.0
Old Bio Index (0 to 5)	1.15	1.15
New Bio Index (0 to 10)	1.90	1.90
% dominant taxa	19.9%	19.9%
EPT/EPT+C	0.731	0.731
EPT/Richness	0.568	0.568
% Model Affinity (orders)	63.9%	63.9%
PPCS - functional groups	48.3%	48.3%
Major Groups:		
Coleoptera (%)	0.00%	0.00%
Diptera (%)	33.4%	33.4%
Ephemeroptera (%)	3.59%	3.59%
Trichoptera (%)	19.3%	19.3%
Plecoptera (%)	39.5%	39.5%
Oligochaeta (%)	3.59%	3.59%
Bivalvia (%)	0.00%	0.00%
Megaloptera (%)	0.00%	0.00%
Odonata (%)	0.55%	0.55%
Other (%)	0.00%	0.00%
Total (%)	100%	100%
Feeding Groups:		
Collector Gatherer (%)	28.2%	28.2%
Collector Filterer (%)	13.0%	13.0%
Predator (%)	28.7%	28.7%
Shredder - Detritus (%)	29.0%	29.0%
Shredder - Herbivore (%)	0.00%	0.00%
Scraper (%)	1.10%	1.10%
Total (%)	100%	100%

Prepared By VHB Pioneer
Project MWT Summer Biomonitoring
Station Upstream **Latitude** 44°8'16.62"N
Stream Rice Brook **Longitude** 72°53'18.74"W
Location BU-1B **Class** Small, High Gradient, B2-3
Sample Date 09/20/09 **Sampler** Cathy Szal

APPLICATION OF STATE OF VERMONT DEC BIOCRITERIA (2/10/04)

Metric	Value	Metric Scoring Results Based on DEC Thresholds for SHG Streams					
		Class B2-3		Class B1		Class A	
		Threshold	Outcome	Threshold	Outcome	Threshold	Outcome
Density	362	≥300	Pass	≥400	I-	≥500	Fail
Richness	37.0	≥27	Pass	≥31	Pass	≥35	Pass
EPT	21.0	≥16	Pass	≥19	Pass	≥21	I+
PMA-O	63.9%	≥45%	Pass	≥55%	Pass	≥65%	I-
BI (New 1-10)	1.90	≤4.50	Pass	≤3.50	Pass	≤3.00	Pass
% Oligo	3.59%	≤12%	Pass	≤5	I+	≤2	Fail
EPT/EPT+C	0.731	≥0.45	Pass	≥0.55	Pass	≥0.65	Pass
PPCS-FG	48.3%	≥ 40%	Pass	≥ 45%	I+	≥ 50%	I-
Outcome:		**Biocriteria are met**					
The following metrics do not meet Class B2-3 thresholds:		NA					

Individual Metric Outcome Guidelines (using the table below)
1) A metric is scored "pass" when the result meets the full support requirements
2) A metric is scored "I+" when the result is between the threshold level and the full support level
3) A metric is scored "I-" when the result is between the threshold level and the non-support level
4) A metric is scored "Fail" when the result is below the non-support requirements

Overall Outcome Guidelines
1) Biocriteria are "met" when: a) five or more metrics are scored "pass" and no metrics have a score of "I-" or "Fail".
2) Biocriteria are "not met" when one or more metrics are scored "failed".
3) In situations where neither items 1 or 2 are the result, an "indeterminate" finding will be made

Scoring Guidelines - Wadeable Stream Category SHG

WQ Class	Score	Density	Richness	EPT	PMA-O	BI	% Oligo	EPT/ EPT+C	PPCS-F
A-1	Full Support	>605	>36	>22	>70%	<2.70	<1%	>0.67	>55%
	Threshold	≥500	≥35	≥21	≥65%	≤3	≤2%	≥0.65	≥50%
	Non-Support	<450	<34	<20	<60%	>3.30	>3%	<0.63	<45%
B1	Full Support	>450	>32	>20	>60%	<3.35	<3.5%	>0.57	>50%
	Threshold	≥400	≥31	≥19	≥55%	≤3.5	≤5%	≥0.55	≥45%
	Non-Support	<350	<30	<18	<50%	>3.65	>6.5%	<0.53	<40%
B2-3	Full Support	>350	>28	>17	>50%	<4.35	<9.5%	>0.47	>45%
	Threshold	≥300	≥27	≥16	≥45%	≤4.5	≤12%	≥0.45	≥40%
	Non-Support	<250	<26	<15	<40%	>4.65	>14.5%	<0.43	<35%

MWT Summer Biomonitoring

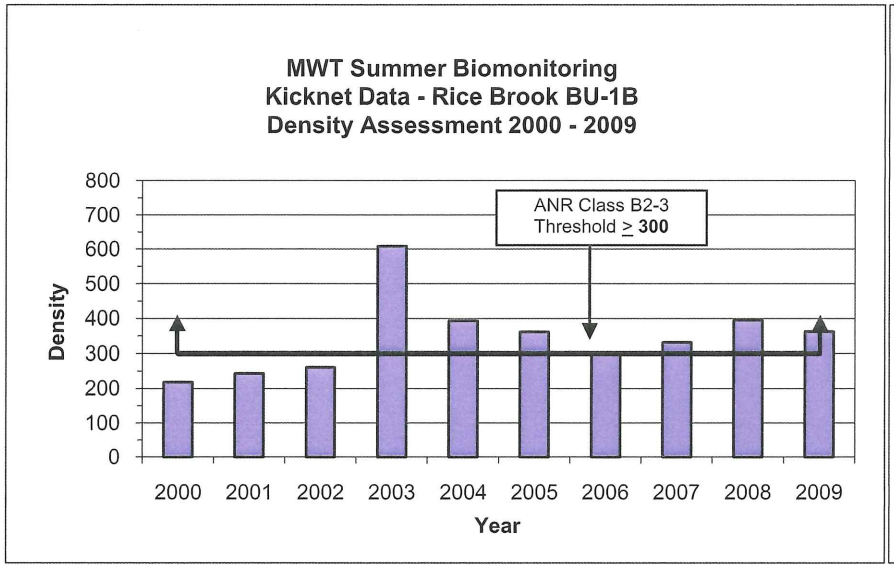
Kicknet Data - Rice Brook BU-1B

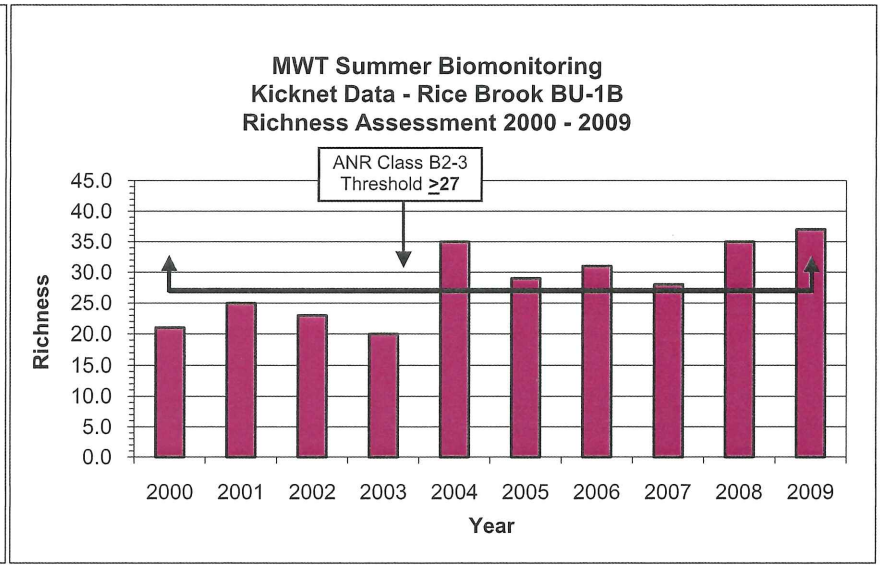
Class B2-3

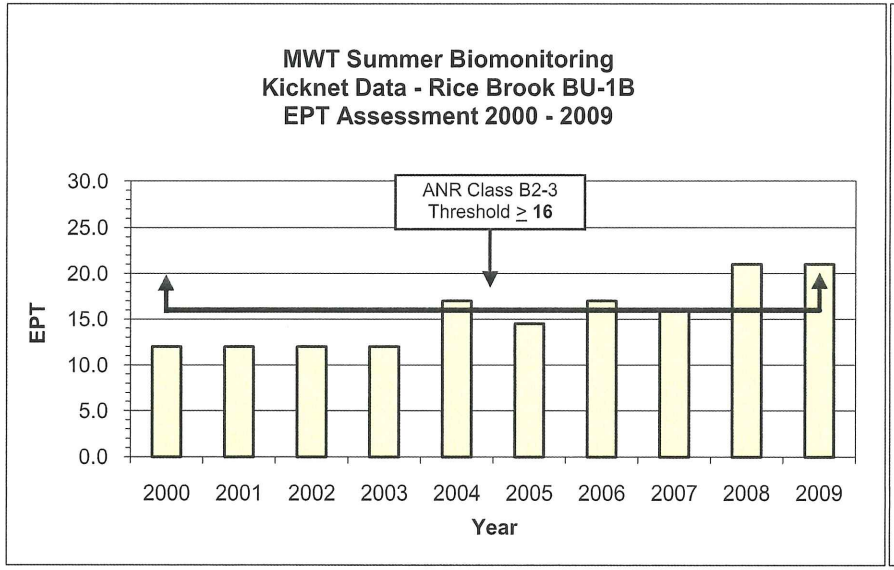
Year	Density	Richness	EPT	% PMA-O	BI	% Oligo.	EPT/EPT +C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45%	≤4.50	≤12%	≥0.45	≥40%	
2000	**218**	**21.0**	**12.0**	49.9	0.90	1.80	0.900	**37.0**	Biocriteria Not Met
2001	**243**	**25.0**	**12.0**	63.0	2.25	0.00	0.610	54.0	Biocriteria Not Met
2002	**261**	**23.0**	**12.0**	58.0	2.81	0.00	0.500	52.0	Biocriteria Not Met
2003	609	**20.0**	**12.0**	65.3	1.09	1.50	0.890	45.0	Biocriteria Not Met
2004	393	35.0	17.0	79.4	2.22	6.40	0.751	53.0	Biocriteria Met
2005	362	29.0	**14.5**	60.9	2.51	1.00	0.640	48.0	Biocriteria Not Met
2006	302	31.0	17.0	73.7	2.20	0.99	0.765	47.0	Biocriteria Met
2007	332	28.0	16.0	84.4	2.37	0.60	0.856	57.2	Biocriteria Met
2008	395	35.0	21.0	87.2	2.85	1.01	0.728	71.0	Biocriteria Met
2009	362	37.0	21.0	63.9	1.90	3.59	0.731	48.3	Biocriteria Met

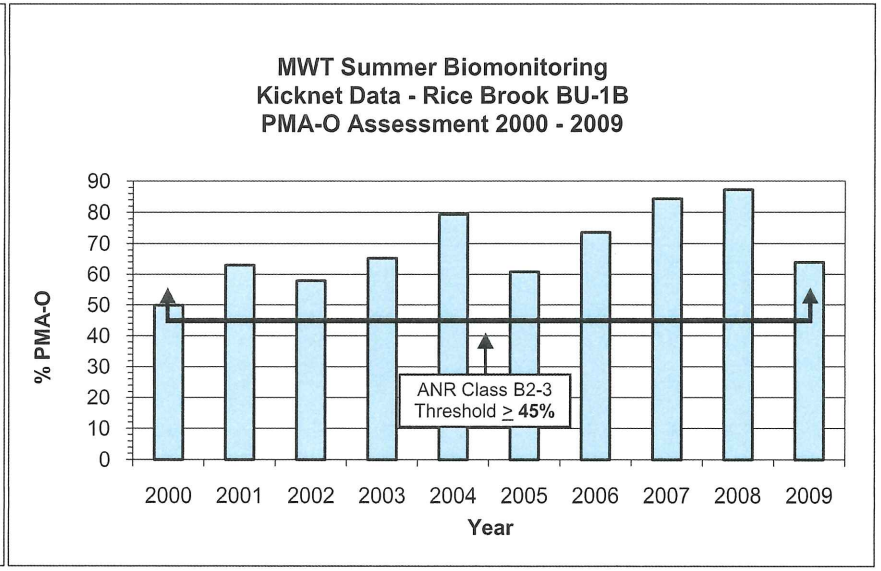
Bold/shade denotes metric did not meet Class B2-3 biocriteria threshold

MWT Summer Biomonitoring
Kicknet Data - Rice Brook BU-1B
Summary Metric Charts



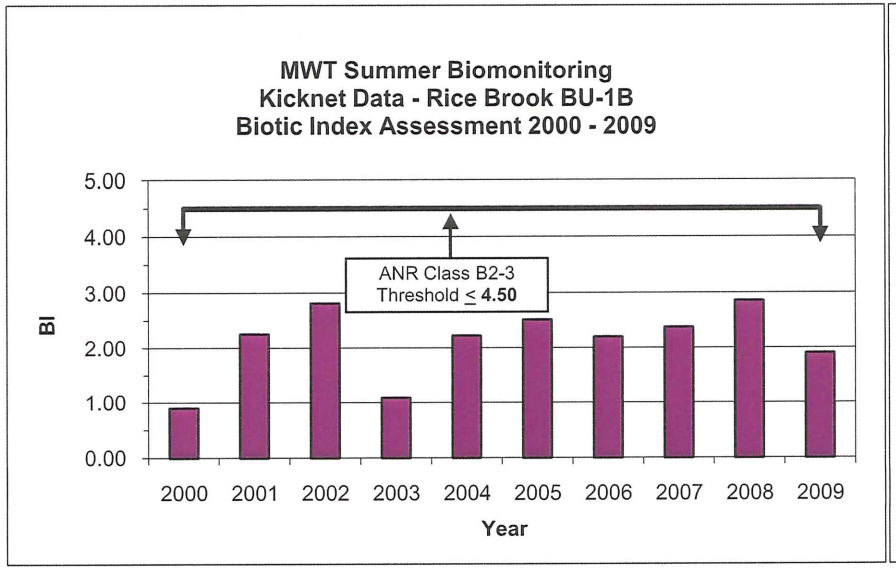


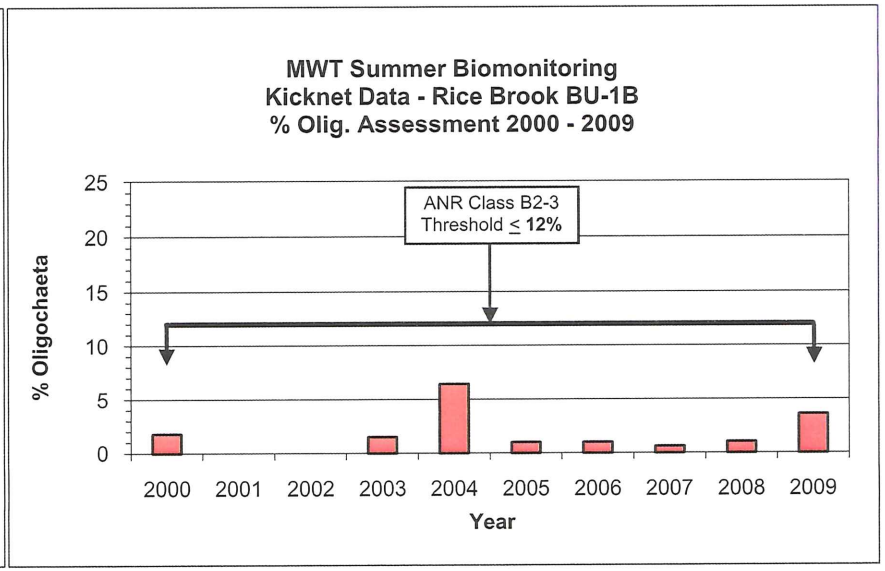


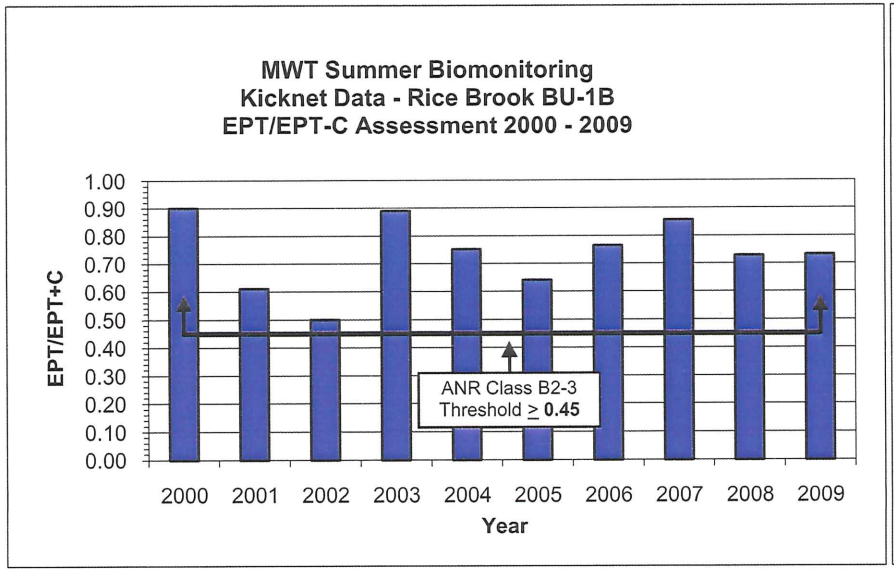


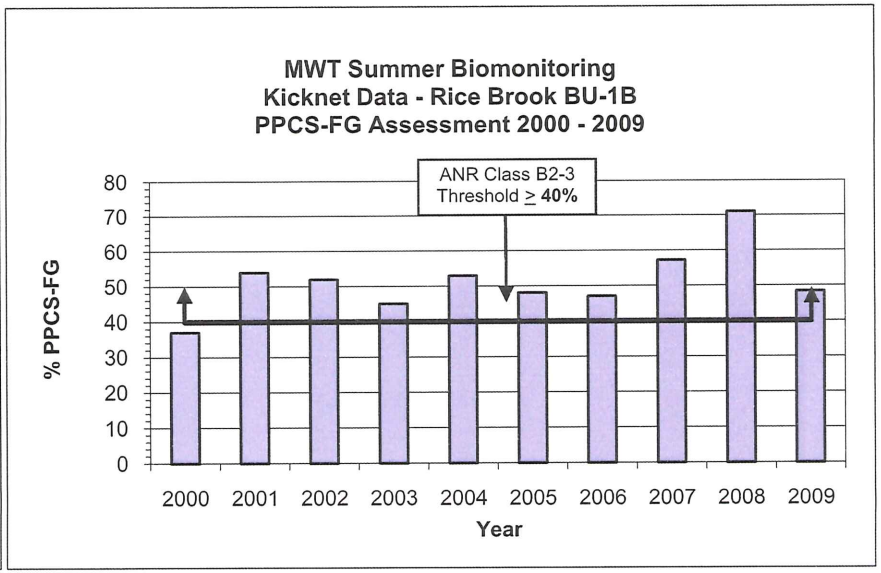
F:\57050.02\ssheets\2009 IDP\Biomonitoring_Kicknet_BU1b.xls, BU1b_Summary Charts, 2/12/2010

MWT Summer Biomonitoring
Kicknet Data - Rice Brook BU-1B
Summary Metric Charts









LOTIC BENTHOS FIELD SHEET

Site Location:
River (site) ____Rice Brook_____River Mile _____Site ID____BD-2_____ BioLab ID _____
Town_____Warren_____ Stream Order_____ Drainage Area _____Km² Elevation _1450_ft
Latitude _____ Longitude _____ Lat/Long source (GPS, USGS Map,Datum) _____
Site Description_____

Sampling Information:
Date__9/20/2009__Time__13:00__Personnel (circle sampler)___Cathy Szal___ Gear__MAS and kick net
Effort time (min)__2__Area (m²)_____ Mesh (um)_590___Quantitative : Y / N #Reps__2_____Comp/rep __4
Weather___sunny_____ Flow/Weather Previous (2 weeks/2days)___fairly quiet 2 weeks
Baseflow_____, or Freshet flow_____ Rising / Receding _____ Present Flow: H - **M** - L

General observations circle those that apply: Overall Aesthetic Rating 0 (poor) – 5 (exc.)__3__

A: Debris Obvious Pollution: Sludge, Sawdust, Paper Fiber, **Sand, Silt**, Sewage, Oily Sheen, Trash, **Iron**, Scum, None

B: Water Clarity **Clear**, Slightly Turbid, Moderately Turbid, Very Turbid, Secci Tube_____mm

C: Water Color **Clear**, Green, Milky, Brown (Tannic) L M H , Gray, Metallic, Reddish

D: Odors **None**, Musty, Fishy, Sewage, Manure, Sulfur(eggs), Oily/gas

Embeddedness: 0-5% Excel (5) **5-25% V Good (4)** 25-50% Good (3) 50-75% Fair (2) > 75% Poor (1) Estimate_____%
Silt rating (0-5)__3-4__(0=none, 5= high) CPOM rating (leaf packs) (0-5):__2__(0= none,5=high)
Snags/debris dams #__0__/__100__m (reach)

Bank Stability: EX, G , F , **P** ; **Riparian Width** (facing upstream) L__100__ft, R__>100__ft

% Canopy: 100 **90** 80 70 60 50 40 30 20 10 0 Overhead = Open, Partly Open, or **Closed** *(See back for Densiometer form)*

Vegetation: (both sides) %: Overstory: Softwood __40__Hardwood__60
(Does not need to add up to 100%) %: Understory: Shrub(brush)__10__Grass_____Herbaceous__10
Surrounding Land Use:__Residential, Ski Area, Forest

Periphyton Cover: For each type 0-100% (*See back for Periphyton Cover Form*)
Diatom __70__% Filamentous green _____% and length _____(in) Blue Green _____% Moss __trace__% Green_____%
Other _____% General Trophic Rating (0-5)_____(0=oligo, 5=Eutroph)

General Water Type:
Riffle__✓__Winder _____ Other _____ Warm _____ Cold __✓__Mixed _____
B.F.Width__10-15__(ft) Wetted Width__8-12__(ft) Riffle Depth__4-8__(in) Pool Depth__12__(in) and Obs _____
Velocity (measured): _____ ft/sec, Velocity RANGE-estimate: _____ <0.4 ft/sec (S)__✓__ 0.4-2 ft/sec (M) _____ >2 ft/sec (F)
Channelized: Y / **N** Upstream Dam: Y ____mi / **N** Other modifications: _____culvert_____

Water Quality Parameters: Field (Record) or Collected (Circle), Meter (type, #)_____Chemistry LabId_____
Temp Air__68__°F Water__11.5__°C fpH_____lab pH_____ fCond_____labCond _____D.O.%_____ D.Omg/l_____

Cond pH Alkalinity Color_____ TSS TP DP Cl SO4 Turb TN N02-3 TNH3 DOC Ca Mg Na K Hardness Metals
*Other*____,____,____,____,____,_____,_____,_____,_____
Field Sheet Complete:__CCS__(initial) **Photo's:** _____ **Fish Survey Conducted (circle):** Y / **N**

Site Sketch & Observations

Aquatic Biota Observed: juvenile trout

NOTES:

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook **Class** Small, High Gradient, B2-3
Location BD-2
Sample Date 09/20/09 **Sampler** Cathy Szal

Taxonomic Data							Biotic Index				Richness Metrics	
							Biotic Index Scores		Old BI (1-5)	New BI (1-10)	Richness	EPT
Key	Order	Genus	Species	# Org's	FFG	Chiro	Old BI	New BI	KN-1	KN-1	KN-1	KN-1
02.03.003.00	DIPTERA	BEZZIA	sp		PRD	N	3	6	-	-	-	
02.05.005.00	DIPTERA	BRILLIA	sp	8	SRD	Y	3	5	24	40	1	
02.05.017.00	DIPTERA	CORYNONEURA	sp	7	CG	Y	2	4	14	28	1	
02.05.065.00	DIPTERA	ORTHOCLADIUS	sp		CG	Y	3	7	-	-	-	
02.05.075.00	DIPTERA	PARAMETRIOCNEMUS	sp	18	CG	Y	3	5	54	90	1	
02.05.076.00	DIPTERA	PARAPHAENOCLADIUS	sp		CG	Y	2	4	-	-	-	
02.05.085.05	DIPTERA	POLYPEDILUM	aviceps		CG	Y	3	5	-	-	-	
02.05.096.00	DIPTERA	RHEOCRICOTOPUS	sp		CG	Y	2	6	-	-	-	
02.05.114.02	DIPTERA	TVETENIA	bavarica	26	CG	Y	2	4	52	104	1	
02.05.121.00	DIPTERA	MICROPSECTRA	sp		CG	Y	3	6	-	-	-	
02.06.001.00	DIPTERA	DIXA	sp		CG	N	2	1	-	-	-	
02.14.004.00	DIPTERA	PROSIMULIUM	sp	4	CF	N	1	2	4	8	1	
02.19.003.00	DIPTERA	DICRANOTA	sp	10	PRD	N	2	3	20	30	1	
02.19.006.00	DIPTERA	HEXATOMA	sp	5	PRD	N	2	2	10	10	1	
02.19.016.00	DIPTERA	TIPULA	sp	4	SRD	N	3	6	12	24	1	
03.01.001.09	EPHEMEROPTERA	BAETIS	tricaudatus	8	CG	N	3	6	24	48	1	1
03.04.005.02	EPHEMEROPTERA	EURYLOPHELLA	funeralis	1	SHR	N	1	0	1	0	1	1
03.06.003.00	EPHEMEROPTERA	EPEORUS	sp	2	CG	N	0	0	0	0	1	1
03.06.007.91	EPHEMEROPTERA	STENONEMA	sp a	2	SCR	N	2	3	4	6	1	1
03.07.005.00	EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	5	CG	N	2	1	10	5	1	1
04.05.006.00	TRICHOPTERA	PARAPSYCHE	sp	12	CF	N	0	0	0	0	1	1
04.05.008.04	TRICHOPTERA	SYMPHITOPSYCHE	alhedra	35	CF	N	2	3	70	105	1	1
04.05.008.06	TRICHOPTERA	SYMPHITOPSYCHE	slossonae		CF	N	2	4	-	-	-	0
04.05.008.07	TRICHOPTERA	SYMPHITOPSYCHE	sparna	20	CF	N	2	4	40	80	1	1
04.05.008.09	TRICHOPTERA	SYMPHITOPSYCHE	ventura	14	CF	N	1	3	14	42	1	1
04.07.001.00	TRICHOPTERA	LEPIDOSTOMA	sp	5	SRD	N	1	1	5	5	1	1
04.11.001.00	TRICHOPTERA	PSILOTRETA	sp	2	SCR	N	0	0	0	0	1	1
04.12.002.00	TRICHOPTERA	DOLOPHILODES	sp	6	CF	N	0	0	0	0	1	1
04.16.001.01	TRICHOPTERA	RHYACOPHILA	fuscula	1	PRD	N	1	2	1	2	1	1
04.16.001.03	TRICHOPTERA	RHYACOPHILA	carolina		PRD	N	0	0	-	-	-	0
04.16.001.09	TRICHOPTERA	RHYACOPHILA	minora		PRD	N	0	0	-	-	-	0
04.16.001.12	TRICHOPTERA	RHYACOPHILA	invaria		PRD	N	1	1	-	-	-	0
04.18.001.00	TRICHOPTERA	NEOPHYLAX	sp	1	SCR	N	2	3	2	3	1	1
05.01.000.01	PLECOPTERA	CAPNIIDAE	imm	2	SRD	N	1	3	2	6	1	1
05.02.000.01	PLECOPTERA	CHLOROPERLIDAE	imm	66	PRD	N	0	0	0	0	1	1
05.03.000.01	PLECOPTERA	LEUCTRIDAE	imm	74	SRD	N	0	0	0	0	1	1
05.05.001.00	PLECOPTERA	PELTOPERLA	sp	23	SRD	N	1	0	23	0	1	1
05.07.007.00	PLECOPTERA	MALIREKUS	sp	30	PRD	N	1	2	30	60	1	1
05.08.001.02	PLECOPTERA	PTERONARCYS	proteus	2	SRD	N	1	0	2	0	1	1
18.06.000.00	OLIGOCHAETA	LUMBRICINA	unid	1	CG	N	-	-	-	-	1	
			TOTAL # of Organisms:	**394**								

Total BI Score	418	696	**Total Richness**	**Total EPT-R**
Total # Organisms	394	394		
# of Organisms w/o BI	1	1	29	
Total # Organisms with BI	393	393		20
Biotic Index	1.06	1.77		

Major Taxonomic Group Statistics

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BD-2
Sample Date 09/20/09

Key	KN-1: Numbers of Organisms									
	COLEOPTERA	DIPTERA	EPHEMEROPTERA	TRICHOPTERA	PLECOPTERA	OLIGOCHAETA	BIVALVIA	MEGALOPTERA	ODONATA	TOTAL
02.03.003.00	0	0	0	0	0	0	0	0	0	
02.05.005.00	0	8	0	0	0	0	0	0	0	
02.05.017.00	0	7	0	0	0	0	0	0	0	
02.05.065.00	0	0	0	0	0	0	0	0	0	
02.05.075.00	0	18	0	0	0	0	0	0	0	
02.05.076.00	0	0	0	0	0	0	0	0	0	
02.05.085.05	0	0	0	0	0	0	0	0	0	
02.05.096.00	0	0	0	0	0	0	0	0	0	
02.05.114.02	0	26	0	0	0	0	0	0	0	
02.05.121.00	0	0	0	0	0	0	0	0	0	
02.06.001.00	0	0	0	0	0	0	0	0	0	
02.14.004.00	0	4	0	0	0	0	0	0	0	
02.19.003.00	0	10	0	0	0	0	0	0	0	
02.19.006.00	0	5	0	0	0	0	0	0	0	
02.19.016.00	0	4	0	0	0	0	0	0	0	
03.01.001.09	0	0	8	0	0	0	0	0	0	
03.04.005.02	0	0	1	0	0	0	0	0	0	
03.06.003.00	0	0	2	0	0	0	0	0	0	
03.06.007.91	0	0	2	0	0	0	0	0	0	
03.07.005.00	0	0	5	0	0	0	0	0	0	
04.05.006.00	0	0	0	12	0	0	0	0	0	
04.05.008.04	0	0	0	35	0	0	0	0	0	
04.05.008.06	0	0	0	0	0	0	0	0	0	
04.05.008.07	0	0	0	20	0	0	0	0	0	
04.05.008.09	0	0	0	14	0	0	0	0	0	
04.07.001.00	0	0	0	5	0	0	0	0	0	
04.11.001.00	0	0	0	2	0	0	0	0	0	
04.12.002.00	0	0	0	6	0	0	0	0	0	
04.16.001.01	0	0	0	1	0	0	0	0	0	
04.16.001.03	0	0	0	0	0	0	0	0	0	
04.16.001.09	0	0	0	0	0	0	0	0	0	
04.16.001.12	0	0	0	0	0	0	0	0	0	
04.18.001.00	0	0	0	1	0	0	0	0	0	
05.01.000.01	0	0	0	0	2	0	0	0	0	
05.02.000.01	0	0	0	0	66	0	0	0	0	
05.03.000.01	0	0	0	0	74	0	0	0	0	
05.05.001.00	0	0	0	0	23	0	0	0	0	
05.07.007.00	0	0	0	0	30	0	0	0	0	
05.08.001.02	0	0	0	0	2	0	0	0	0	
18.06.000.00	0	0	0	0	0	1	0	0	0	
Total	**0**	**82**	**18**	**96**	**197**	**1**	**0**	**0**	**0**	**394**
Percent	**0.00%**	**20.8%**	**4.57%**	**24.4%**	**50.0%**	**0.25%**	**0.00%**	**0.00%**	**0.00%**	**100%**

Functional Feeding Group Analysis

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BD-2
Sample Date 09/20/09

Key	KN-1: Numbers of Organisms						
	CG	CF	PRD	SRD	SHR	SCR	Total
02.03.003.00	0	0	0	0	0	0	
02.05.005.00	0	0	0	8	0	0	
02.05.017.00	7	0	0	0	0	0	
02.05.065.00	0	0	0	0	0	0	
02.05.075.00	18	0	0	0	0	0	
02.05.076.00	0	0	0	0	0	0	
02.05.085.05	0	0	0	0	0	0	
02.05.096.00	0	0	0	0	0	0	
02.05.114.02	26	0	0	0	0	0	
02.05.121.00	0	0	0	0	0	0	
02.06.001.00	0	0	0	0	0	0	
02.14.004.00	0	4	0	0	0	0	
02.19.003.00	0	0	10	0	0	0	
02.19.006.00	0	0	5	0	0	0	
02.19.016.00	0	0	0	4	0	0	
03.01.001.09	8	0	0	0	0	0	
03.04.005.02	0	0	0	0	1	0	
03.06.003.00	2	0	0	0	0	0	
03.06.007.91	0	0	0	0	0	2	
03.07.005.00	5	0	0	0	0	0	
04.05.006.00	0	12	0	0	0	0	
04.05.008.04	0	35	0	0	0	0	
04.05.008.06	0	0	0	0	0	0	
04.05.008.07	0	20	0	0	0	0	
04.05.008.09	0	14	0	0	0	0	
04.07.001.00	0	0	0	5	0	0	
04.11.001.00	0	0	0	0	0	2	
04.12.002.00	0	6	0	0	0	0	
04.16.001.01	0	0	1	0	0	0	
04.16.001.03	0	0	0	0	0	0	
04.16.001.09	0	0	0	0	0	0	
04.16.001.12	0	0	0	0	0	0	
04.18.001.00	0	0	0	0	0	1	
05.01.000.01	0	0	0	2	0	0	
05.02.000.01	0	0	66	0	0	0	
05.03.000.01	0	0	0	74	0	0	
05.05.001.00	0	0	0	23	0	0	
05.07.007.00	0	0	30	0	0	0	
05.08.001.02	0	0	0	2	0	0	
18.06.000.00	1	0	0	0	0	0	
Total	**67**	**91**	**112**	**118**	**1**	**5**	**394**
Percent	**17.0%**	**23.1%**	**28.4%**	**29.9%**	**0.25%**	**1.27%**	**100%**

Functional Feeding Group Analysis

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BD-2
Sample Date 09/20/09

	Model			Kicknet 1 vs. SHG	
	SHG	**MHG**	**WWMG**	**KN-1**	**PPCS**
Col. Gath.	31%	32%	22%	17.0%	54.9%
Col. Filt.	18%	30%	36%	23.1%	77.9%
Predator	19%	13%	7%	28.4%	66.8%
Shred-Det.	15%	4%	2%	29.9%	50.1%
Shred- Herb.	1%	1%	5%	0.25%	25.4%
Scraper	12%	13%	22%	1.27%	10.6%
				PPCS-FG =	**47.6%**

CG = Collector/Gatherer

CF = Collector/Filterer

PRD = Predator

SRD = Shredder - Detritus

SHR = Shredder - Herbivore

SCR = Scraper

Percent Model Affinity of Orders (PMA-O) Calculations

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BD-2 **Class** Small, High Gradient, B2-3
Sample Date 09/20/09 **Sampler** Cathy Szal

Order	Model			Kicknet 1 vs. Model (SHG)	
	SHG	MHG	WWMG	%	difference
Coleoptera	8%	6%	13%	0.00%	8.00
Diptera	19%	18%	13%	20.8%	1.81
Ephemeroptera	23%	34%	32%	4.57%	18.4
Plecoptera	21%	8%	8%	50.0%	29.0
Trichoptera	28%	33%	33%	24.4%	3.63
Oligochaeta	0.5%	0.5%	1.0%	0.25%	0.246
Other	0.5%	0.5%	1.0%	0.00%	0.500
				Sum diff	61.6
				Sum diff * 0.5	30.8
				100-(sum diff * 0.5)	69.2
				% model affinity	**69.2%**

EPT / EPT+C Calculations

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BD-2
Sample Date 09/20/09
Class Small, High Gradient, B2-3
Sampler Cathy Szal

	KN-1
#EPT organisms	311
#C organisms	59
EPT/EPT+C	0.841

Biometric Summary

Project MWT Summer Biomonitoring
Station Upstream
Stream Rice Brook
Location BD-2 **Class** Small, High Gradient, B2-3
Sample Date 09/20/09 **Sampler** Cathy Szal

Replicate # Sampling Method	1 KN	Average KN
Biometrics:		
Density/Unit	394	394
Species Richness	29.0	29.0
EPT Richness	20.0	20.0
Old Bio Index (0 to 5)	1.06	1.06
New Bio Index (0 to 10)	1.77	1.77
% dominant taxa	18.8%	18.8%
EPT/EPT+C	0.841	0.841
EPT/Richness	0.690	0.690
% Model Affinity (orders)	69.2%	69.2%
PPCS - functional groups	47.6%	47.6%
Major Groups:		
Coleoptera (%)	0.00%	0.00%
Diptera (%)	20.8%	20.8%
Ephemeroptera (%)	4.57%	4.57%
Trichoptera (%)	24.4%	24.4%
Plecoptera (%)	50.0%	50.0%
Oligochaeta (%)	0.25%	0.25%
Bivalvia (%)	0.00%	0.00%
Megaloptera (%)	0.00%	0.00%
Odonata (%)	0.00%	0.00%
Other (%)	0.00%	0.00%
Total (%)	100%	100%
Feeding Groups:		
Collector Gatherer (%)	17.0%	17.0%
Collector Filterer (%)	23.1%	23.1%
Predator (%)	28.4%	28.4%
Shredder - Detritus (%)	29.9%	29.9%
Shredder - Herbivore (%)	0.25%	0.25%
Scraper (%)	1.27%	1.27%
Total (%)	100%	100%

Prepared By VHB Pioneer
Project MWT Summer Biomonitoring
Station Upstream **Latitude** 44°8'16.48"N
Stream Rice Brook **Longitude** 72°53'12.31"W
Location BD-2 **Class** Small, High Gradient, B2-3
Sample Date 09/20/09 **Sampler** Cathy Szal

APPLICATION OF STATE OF VERMONT DEC BIOCRITERIA (2/10/04)

Metric	Value	Metric Scoring Results Based on DEC Thresholds for SHG Streams					
		Class B2-3		Class B1		Class A	
		Threshold	Outcome	Threshold	Outcome	Threshold	Outcome
Density	394	≥300	Pass	≥400	I-	≥500	Fail
Richness	29.0	≥27	Pass	≥31	Fail	≥35	Fail
EPT	20.0	≥16	Pass	≥19	Pass	≥21	Fail
PMA-O	69.2%	≥45%	Pass	≥55%	Pass	≥65%	I+
BI (New 1-10)	1.77	≤4.50	Pass	≤3.50	Pass	≤3.00	Pass
% Oligo	0.25%	≤12%	Pass	≤5	Pass	≤2	Pass
EPT/EPT+C	0.841	≥0.45	Pass	≥0.55	Pass	≥0.65	Pass
PPCS-FG	47.6%	≥ 40%	Pass	≥ 45%	I+	≥ 50%	I-
Outcome:		**Biocriteria are met**					
The following metrics do not meet Class B2-3 thresholds:		NA					

Individual Metric Outcome Guidelines (using the table below)
1) A metric is scored "pass" when the result meets the full support requirements
2) A metric is scored "I+" when the result is between the threshold level and the full support level
3) A metric is scored "I-" when the result is between the threshold level and the non-support level
4) A metric is scored "Fail" when the result is below the non-support requirements

Overall Outcome Guidelines
1) Biocriteria are "met" when: a) five or more metrics are scored "pass" and no metrics have a score of "I-" or "Fail".
2) Biocriteria are "not met" when one or more metrics are scored "failed".
3) In situations where neither items 1 or 2 are the result, an "indeterminate" finding will be made

Scoring Guidelines - Wadeable Stream Category SHG

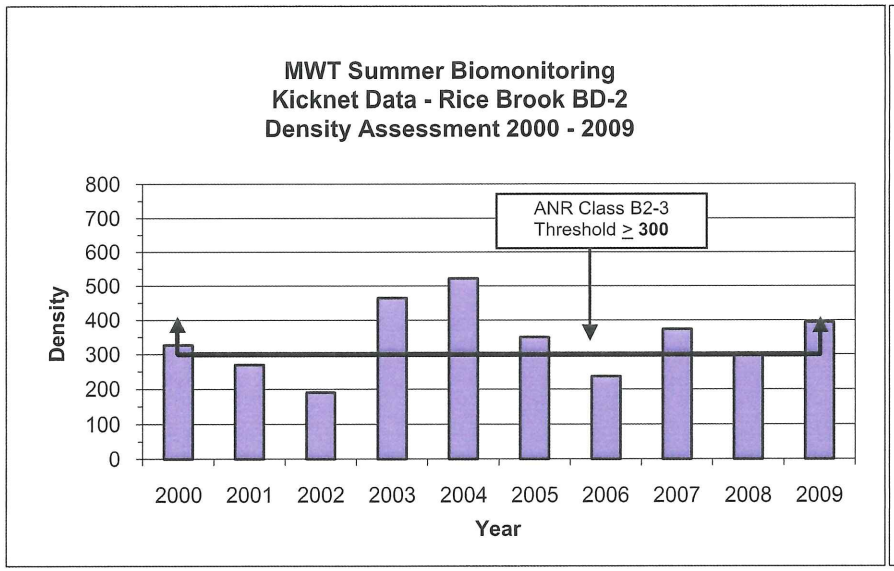
WQ Class	Score	Density	Richness	EPT	PMA-O	BI	% Oligo	EPT/ EPT+C	PPCS-F
A-1	Full Support	>605	>36	>22	>70%	<2.70	<1%	>0.67	>55%
	Threshold	≥500	≥35	≥21	≥65%	≤3	≤2%	≥0.65	≥50%
	Non-Support	<450	<34	<20	<60%	>3.30	>3%	<0.63	<45%
B1	Full Support	>450	>32	>20	>60%	<3.35	<3.5%	>0.57	>50%
	Threshold	≥400	≥31	≥19	≥55%	≤3.5	≤5%	≥0.55	≥45%
	Non-Support	<350	<30	<18	<50%	>3.65	>6.5%	<0.53	<40%
B2-3	Full Support	>350	>28	>17	>50%	<4.35	<9.5%	>0.47	>45%
	Threshold	≥300	≥27	≥16	≥45%	≤4.5	≤12%	≥0.45	≥40%
	Non-Support	<250	<26	<15	<40%	>4.65	>14.5%	<0.43	<35%

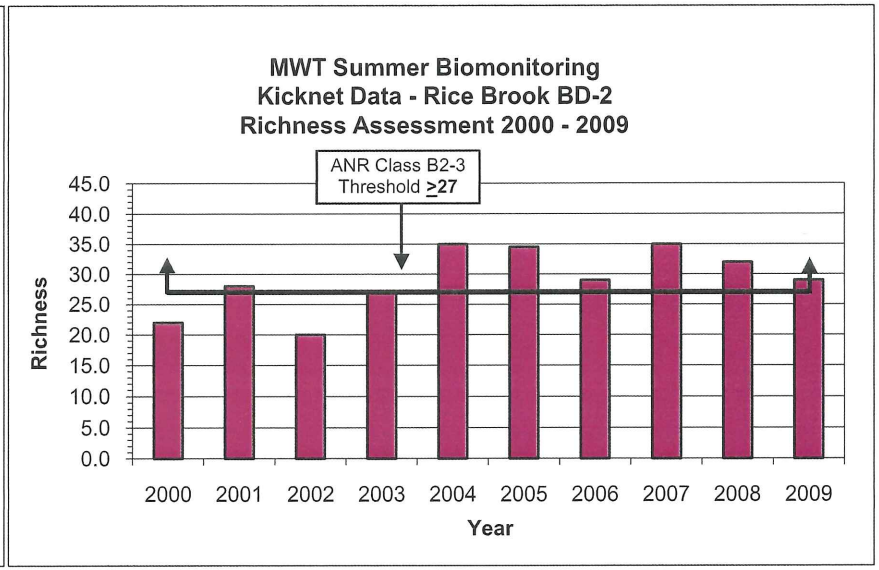
MWT Summer Biomonitoring
Kicknet Data - Rice Brook BD-2
Class B2-3

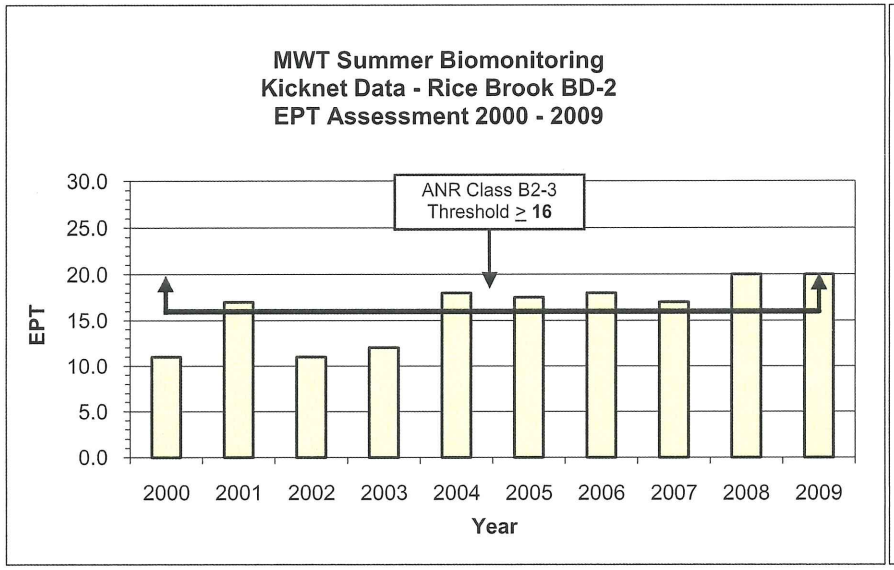
Year	Density	Richness	EPT	% PMA-O	BI	% Oligo.	EPT/EPT +C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45%	≤4.50	≤12%	≥0.45	≥40%	
2000	327	**22.0**	**11.0**	50.1	0.93	0.00	0.870	46.0	Biocriteria Not Met
2001	**269**	28.0	17.0	74.0	2.22	1.10	0.680	55.0	Indeterminate
2002	**190**	**20.0**	**11.0**	61.6	2.21	1.10	0.620	66.0	Biocriteria Not Met
2003	465	27.0	**12.0**	55.3	1.73	0.60	0.740	44.0	Biocriteria Not Met
2004	522	35.0	18.0	68.6	1.55	9.00	0.843	51.0	Biocriteria Met
2005	350	34.5	17.5	59.6	2.78	4.10	0.600	61.0	Biocriteria Met
2006	**236**	29.0	18.0	75.0	2.86	2.97	0.650	43.0	Biocriteria Not Met
2007	374	35.0	17.0	65.9	1.89	2.14	0.768	51.9	Biocriteria Met
2008	**297**	32.0	20.0	68.6	2.16	5.39	0.922	42.9	Indeterminate
2009	394	29.0	20.0	69.2	1.77	0.254	0.841	47.6	Biocriteria Met

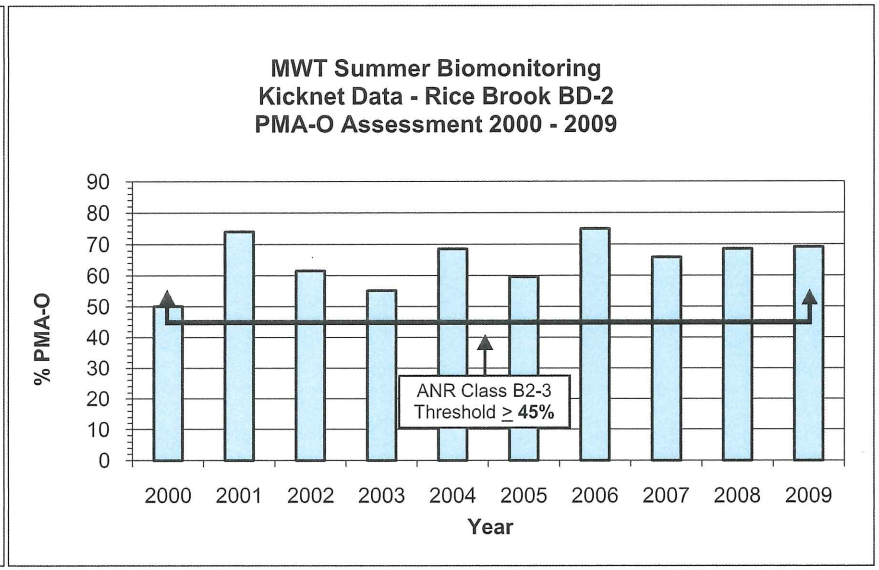
Bold/shade denotes metric did not meet Class B2-3 biocriteria threshold

MWT Summer Biomonitoring
Kicknet Data - Rice Brook BD-2
Summary Metric Charts



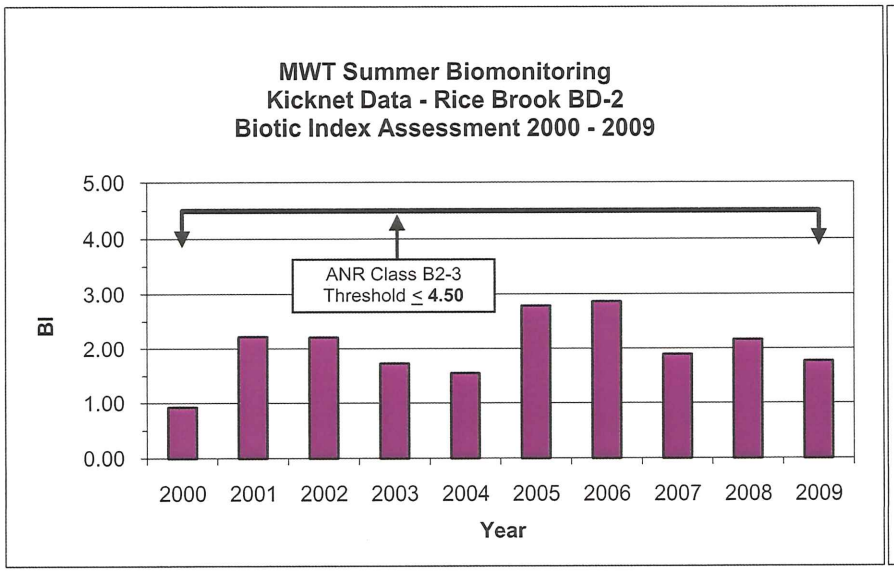


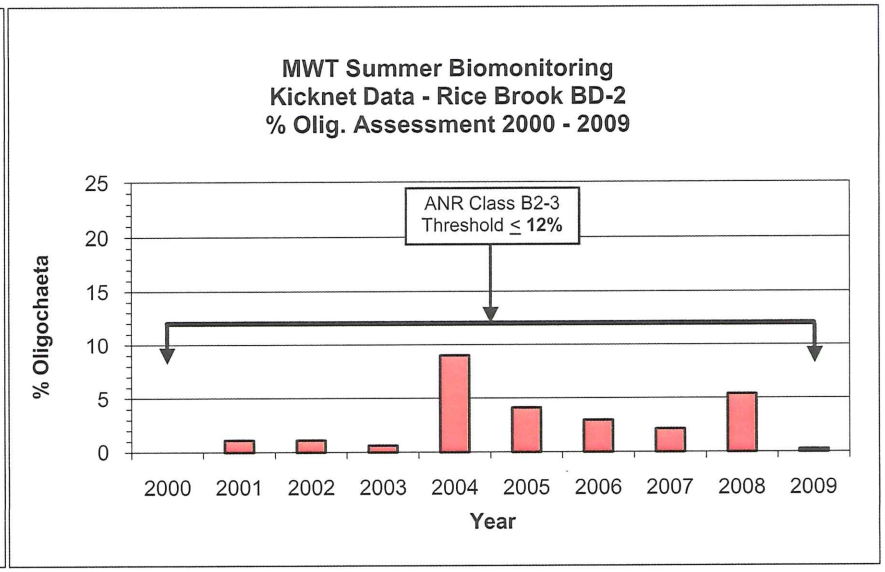


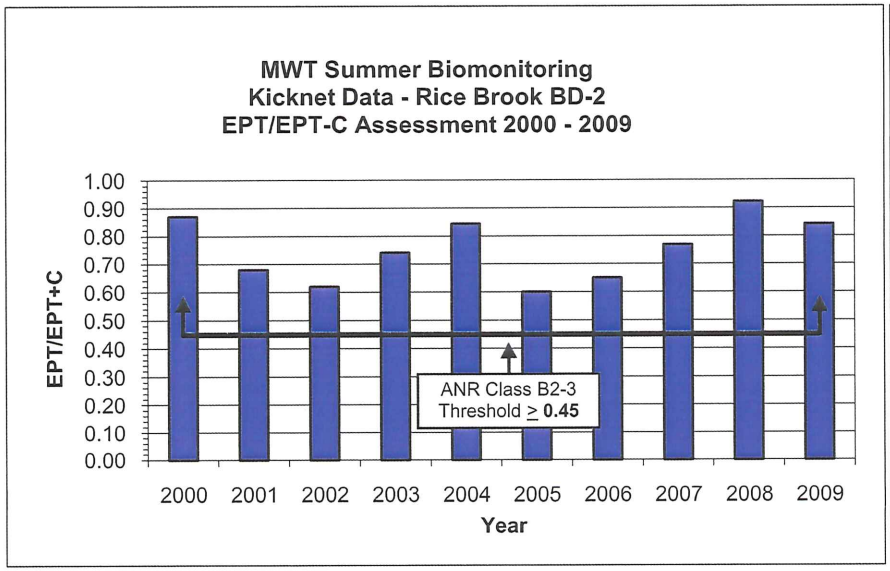


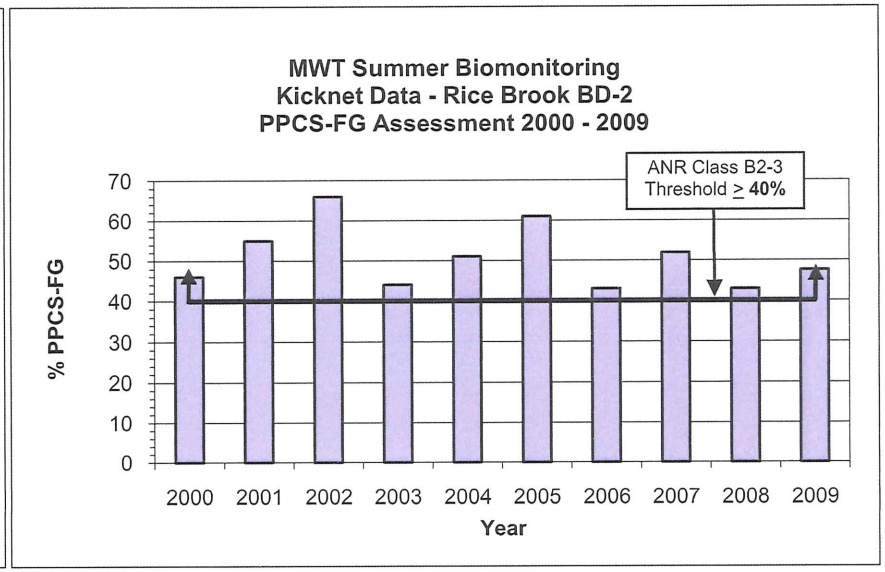
F:\57050.02\ssheets\2009 IDP\Biomonitoring_Kicknet_BD2.xls, BD2_Summary Charts, 2/12/2010

MWT Summer Biomonitoring
Kicknet Data - Rice Brook BD-2
Summary Metric Charts









LOTIC BENTHOS FIELD SHEET

Site Location:
River (site) ___Rice Brook___ River Mile ___ Site ID ___BD-3___ BioLab ID ___
Town ___Warren___ Stream Order ___ Drainage Area ___ Km^2 Elevation _1375_ ft
Latitude ___ Longitude ___ Lat/Long source (GPS, USGS Map,Datum) ___
Site Description ___

Sampling Information:
Date __9/18/2009__ Time __11:10__ Personnel (circle sampler) ___Cathy Szal___ Gear __Kick Net__
Effort time (min) __2__ Area (m^2) ___ Mesh (um) _590_ Quantitative : Y / **N** #Reps __2__ Comp/rep __4__
Weather ___sunny___ Flow/Weather Previous (2 weeks/2days) ___quiet couple of weeks___
Baseflow ___, or Freshet flow ___ Rising / Receding ___ Present Flow: H - **M** - L

General observations circle those that apply: Overall Aesthetic Rating 0 (poor) – 5 (exc.) __3__

A: Debris Obvious Pollution: Sludge, Sawdust, Paper Fiber, **Sand, Silt**, Sewage, Oily Sheen, Trash, Iron, Scum, None

B: Water Clarity **Clear**, Slightly Turbid, Moderately Turbid, Very Turbid, Secci Tube ___mm

C: Water Color **Clear**, Green, Milky, Brown (Tannic) L M H, Gray, Metallic, Reddish

D: Odors **None**, Musty, Fishy, Sewage, Manure, Sulfur(eggs), Oily/gas

Embeddedness: 0-5% Excel (5) 5-25% V Good (4) **25-50% Good (3)** 50-75% Fair (2) >75% Poor (1) Estimate ___%
Silt rating (0-5) __3-4__ (0=none, 5= high) CPOM rating (leaf packs) (0-5): __3__ (0= none,5=high)
Snags/debris dams # __0__ / __100__ m (reach)

Bank Stability: EX, G, F, P; **Riparian Width** (facing upstream) L___ft, R___ft

% Canopy: 100 90 80 70 60 50 40 **30** 20 10 0 Overhead = **Open**, Partly Open, or Closed *(See back for Densiometer form)*

Vegetation: (both sides) %: Overstory: Softwood __50__ Hardwood __50__
(Does not need to add up to 100%) %: Understory: Shrub(brush) __30__ Grass __20__ Herbaceous __40__
Surrounding Land Use: __Residential Development, Ski Area, Forest__

Periphyton Cover: For each type 0-100% (*See back for Periphyton Cover Form*)
Diatom __60__ % Filamentous green ___% and length ___(in) Blue Green __5__ % Moss __trace__ % Green ___%
Other ___% General Trophic Rating (0-5) __2__ (0=oligo, 5=Eutroph)

General Water Type:
Riffle __✓__ Winder ___ Other ___ Warm ___ Cold __✓__ Mixed ___
B.F.Width __15-18__ (ft) Wetted Width __6-12__ (ft) Riffle Depth __1-4__ (in) Pool Depth ___(in) and Obs ___
Velocity (measured): ___ ft/sec, Velocity RANGE-estimate: ___ <0.4 ft/sec (S) __✓__ 0.4-2 ft/sec (M) ___ >2 ft/sec (F)
Channelized: **Y** / N Upstream Dam: Y ___mi / **N** Other modifications: ___culverts___

Water Quality Parameters: Field (Record) or Collected (Circle), Meter (type, #) ___ Chemistry LabId ___
Temp Air __60__ °F Water __11__ °C fpH ___ lab pH ___ fCond ___ labCond ___ D.O.% ___ D.Omg/l ___

Cond pH Alkalinity Color ___ TSS TP DP Cl SO4 Turb TN N02-3 TNH3 DOC Ca Mg Na K Hardness Metals
Other ___, ___, ___, ___, ___, ___, ___, ___, ___
Field Sheet Complete: __CCS__ (initial) **Photo's:** ___ **Fish Survey Conducted (circle):** Y / **N**

Site Sketch & Observations

Aquatic Biota Observed:

NOTES:

Project MWT Summer Biomonitoring
Station Downstream
Stream Rice Brook **Class** Small, High Gradient, B2-3
Location BD-3
Sample Date 09/18/09 **Sampler** Cathy Szal

Taxonomic Data								Biotic Index						Richness Metrics			
				#Org's/KN				Biotic Index Scores		Old Biotic Index (1-5)		New Biotic Index (1-10)		Richness	EPT	Richness	EPT
Key	Order	Genus	Species	KN-1	KN-2	FFG	Chiro	Old BI	New BI	KN-1	KN-2	KN-1	KN-2	KN-1	KN-1	KN-2	KN-2
02.03.003.00	DIPTERA	BEZZIA	sp			PRD	N	3	6	-	-	-	-	-		-	
02.05.005.00	DIPTERA	BRILLIA	sp		1	SRD	Y	3	5	-	3	-	5	-		1	
02.05.008.00	DIPTERA	CARDIOCLADIUS	sp			PRD	Y	3	5	-	-	-	-	-		-	
02.05.017.00	DIPTERA	CORYNONEURA	sp	3	2	CG	Y	2	4	6	4	12	8	1		1	
02.05.018.00	DIPTERA	CRICOTOPUS	spa			SHR	Y	4	7	-	-	-	-	-		-	
02.05.068.00	DIPTERA	PARACHAETOCLADIUS	sp		1	CG	Y	2	2	-	2	-	2	-		1	
02.05.075.00	DIPTERA	PARAMETRIOCNEMUS	sp	23	13	CG	Y	3	5	69	39	115	65	1		1	
02.05.076.00	DIPTERA	PARAPHAENOCLADIUS	sp	3	1	CG	Y	2	4	6	2	12	4	1		1	
02.05.085.05	DIPTERA	POLYPEDILUM	aviceps			CG	Y	3	5	-	-	-	-	-		-	
02.05.096.00	DIPTERA	RHEOCRICOTOPUS	sp			CG	Y	2	6	-	-	-	-	-		-	
02.05.110.00	DIPTERA	THIENEMANNEMYIA	sp			PRD	Y	3	6	-	-	-	-	-		-	
02.05.114.02	DIPTERA	TVETENIA	bavarica	11	23	CG	Y	2	4	22	46	44	92	1		1	
02.05.121.00	DIPTERA	MICROPSECTRA	sp			CG	Y	3	6	-	-	-	-	-		-	
02.06.001.00	DIPTERA	DIXA	sp			CG	N	2	1	-	-	-	-	-		-	
02.14.004.00	DIPTERA	PROSIMULIUM	sp			CF	N	1	2	-	-	-	-	-		-	
02.19.003.00	DIPTERA	DICRANOTA	sp		1	PRD	N	2	3	-	2	-	3	-		1	
02.19.006.00	DIPTERA	HEXATOMA	sp	21	5	PRD	N	2	2	42	10	42	10	1		1	
02.19.016.00	DIPTERA	TIPULA	sp	3	2	SRD	N	3	6	9	6	18	12	1		1	
02.19.019.00	DIPTERA	MOLOPHILUS	sp			CG	N	3	4	-	-	-	-	-		-	
03.01.001.03	EPHEMEROPTERA	BAETIS	flavistriga		10	CG	N	3	5	-	30	-	50	-	0	1	1
03.01.001.09	EPHEMEROPTERA	BAETIS	tricaudatus	120	94	CG	N	3	6	360	282	720	564	1	1	1	1
03.01.006.93	EPHEMEROPTERA	ACENTRELLAPLAUDITUS	sp	11	5	SCR	N	2	4	22	10	44	20	1	1	1	1
03.04.005.02	EPHEMEROPTERA	EURYLOPHELLA	funeralis			SHR	N	1	0	-	-	-	-	-	0	-	0
03.06.003.00	EPHEMEROPTERA	EPEORUS	sp	1	8	CG	N	0	0	0	0	0	0	1	1	1	1
03.06.007.00	EPHEMEROPTERA	STENONEMA	sp		1	SCR	N	2	3	-	2	-	3	-	0	1	1
03.07.005.00	EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	14	7	CG	N	2	1	28	14	14	7	1	1	1	1
04.03.002.00	TRICHOPTERA	GLOSSOSOMA	sp	3		SCR	N	1	0	3	-	0	-	1	1	-	0
04.05.003.00	TRICHOPTERA	DIPLECTRONA	sp	2		CF	N	0	0	0	-	0	-	1	1	-	0
04.05.006.00	TRICHOPTERA	PARAPSYCHE	sp	14	6	CF	N	0	0	0	0	0	0	1	1	1	1
04.05.008.04	TRICHOPTERA	SYMPHITOPSYCHE	alhedra	75	48	CF	N	2	3	150	96	225	144	1	1	1	1
04.05.008.07	TRICHOPTERA	SYMPHITOPSYCHE	sparna	17	10	CF	N	2	4	34	20	68	40	1	1	1	1
04.05.008.09	TRICHOPTERA	SYMPHITOPSYCHE	ventura	8	2	CF	N	1	3	8	2	24	6	1	1	1	1
04.07.001.00	TRICHOPTERA	LEPIDOSTOMA	sp	5	1	SRD	N	1	1	5	1	5	1	1	1	1	1
04.11.001.00	TRICHOPTERA	PSILOTRETA	sp		2	SCR	N	0	0	-	0	-	0	-	0	1	1
04.12.002.00	TRICHOPTERA	DOLOPHILODES	sp	7	8	CF	N	0	0	0	0	0	0	1	1	1	1
04.16.001.01	TRICHOPTERA	RHYACOPHILA	fuscula	6	2	PRD	N	1	2	6	2	12	4	1	1	1	1
04.16.001.03	TRICHOPTERA	RHYACOPHILA	carolina	5	2	PRD	N	0	0	0	0	0	0	1	1	1	1
04.16.001.12	TRICHOPTERA	RHYACOPHILA	invaria			PRD	N	1	1	-	-	-	-	-	0	-	0
04.14.005.00	TRICHOPTERA	POLYCENTROPUS	sp			PRD	N	3	6	-	-	-	-	-	0	-	0
04.20.001.00	TRICHOPTERA	APATANIA	sp			SCR	N	1	3	-	-	-	-	-	0	-	0
05.01.000.01	PLECOPTERA	CAPNIIDAE	imm	3		SRD	N	1	3	3	-	9	-	1	1	-	0
05.02.000.01	PLECOPTERA	CHLOROPERLIDAE	imm	30	30	PRD	N	0	0	0	0	0	0	1	1	1	1
05.03.000.01	PLECOPTERA	LEUCTRIDAE	imm	21	23	SRD	N	0	0	0	0	0	0	1	1	1	1
05.04.002.00	PLECOPTERA	NEMOURA	sp			SRD	N	0	1	-	-	-	-	-	0	-	0
05.06.007.01	PLECOPTERA	AGNETINA	capitata		1	PRD	N	0	2	-	0	-	2	-	0	1	1
05.07.006.00	PLECOPTERA	ISOPERLA	sp			PRD	N	1	2	-	-	-	-	-	0	-	0
05.07.006.91	PLECOPTERA	ISOPERLA	sp a			PRD	N	1	2	-	-	-	-	-	0	-	0
05.07.007.00	PLECOPTERA	MALIREKUS	sp	48	30	PRD	N	1	2	48	30	96	60	1	1	1	1
05.08.001.02	PLECOPTERA	PTERONARCYS	proteus	3		SRD	N	1	0	3	-	0	-	1	1	-	0
06.04.001.00	ODONATA	CORDULEGASTER	sp			PRD	N	1	3	-	-	-	-	-		-	
06.06.007.00	ODONATA	LANTHUS	sp		1	PRD	N	2	5	-	2	-	5	-		1	
07.02.001.00	MEGALOPTERA	SIALIS	sp			PRD	N	3	6	-	-	-	-	-		-	
13.02.002.00	BIVALVIA	PISIDIUM	sp			CF	N	4	8	-	-	-	-	-		-	
18.04.000.00	OLIGOCHAETA	LUMBRICULIDAE	unid	27	10	CG	N	-	-	-	-	-	-	1		1	
18.06.000.00	OLIGOCHAETA	LUMBRICINA	unid	1	2	CG	N	-	-	-	-	-	-	1		1	
			TOTAL # of Organisms:	485	352				Total BI Score	824	605	1460	1107	Total Richness	Total EPT-R	Total Richness	Total EPT-R
									Total # Organisms	485	352	485	352				
									# of Organisms w/o BI	28	12	28	12	27		31	
									Total # Organisms with BI	457	340	457	340		19		19
									Biotic Index	1.80	1.78	3.19	3.26				

Major Taxonomic Group Statistics

Project MWT Summer Biomonitoring
Station Downstream
Stream Rice Brook
Location BD-3
Sample Date 09/18/09

Key	KN-1: Numbers of Organisms										
	COLEOPTERA	DIPTERA	EPHEMEROPTERA	TRICHOPTERA	PLECOPTERA	OLIGOCHAETA	BIVALVIA	MEGALOPTERA	ODONATA	OTHER	TOTAL
02.03.003.00	0	0	0	0	0	0	0	0	0	0	
02.05.005.00	0	0	0	0	0	0	0	0	0	0	
02.05.008.00	0	0	0	0	0	0	0	0	0	0	
02.05.017.00	0	3	0	0	0	0	0	0	0	0	
02.05.018.00	0	0	0	0	0	0	0	0	0	0	
02.05.068.00	0	0	0	0	0	0	0	0	0	0	
02.05.075.00	0	23	0	0	0	0	0	0	0	0	
02.05.076.00	0	3	0	0	0	0	0	0	0	0	
02.05.085.05	0	0	0	0	0	0	0	0	0	0	
02.05.096.00	0	0	0	0	0	0	0	0	0	0	
02.05.110.00	0	0	0	0	0	0	0	0	0	0	
02.05.114.02	0	11	0	0	0	0	0	0	0	0	
02.05.121.00	0	0	0	0	0	0	0	0	0	0	
02.06.001.00	0	0	0	0	0	0	0	0	0	0	
02.14.004.00	0	0	0	0	0	0	0	0	0	0	
02.19.003.00	0	0	0	0	0	0	0	0	0	0	
02.19.006.00	0	21	0	0	0	0	0	0	0	0	
02.19.016.00	0	3	0	0	0	0	0	0	0	0	
02.19.019.00	0	0	0	0	0	0	0	0	0	0	
03.01.001.03	0	0	0	0	0	0	0	0	0	0	
03.01.001.09	0	0	120	0	0	0	0	0	0	0	
03.01.006.93	0	0	11	0	0	0	0	0	0	0	
03.04.005.02	0	0	0	0	0	0	0	0	0	0	
03.06.003.00	0	0	1	0	0	0	0	0	0	0	
03.06.007.00	0	0	0	0	0	0	0	0	0	0	
03.07.005.00	0	0	14	0	0	0	0	0	0	0	
04.03.002.00	0	0	0	3	0	0	0	0	0	0	
04.05.003.00	0	0	0	2	0	0	0	0	0	0	
04.05.006.00	0	0	0	14	0	0	0	0	0	0	
04.05.008.04	0	0	0	75	0	0	0	0	0	0	
04.05.008.07	0	0	0	17	0	0	0	0	0	0	
04.05.008.09	0	0	0	8	0	0	0	0	0	0	
04.07.001.00	0	0	0	5	0	0	0	0	0	0	
04.11.001.00	0	0	0	0	0	0	0	0	0	0	
04.12.002.00	0	0	0	7	0	0	0	0	0	0	
04.16.001.01	0	0	0	6	0	0	0	0	0	0	
04.16.001.03	0	0	0	5	0	0	0	0	0	0	
04.16.001.12	0	0	0	0	0	0	0	0	0	0	
04.14.005.00	0	0	0	0	0	0	0	0	0	0	
04.20.001.00	0	0	0	0	0	0	0	0	0	0	
05.01.000.01	0	0	0	0	3	0	0	0	0	0	
05.02.000.01	0	0	0	0	30	0	0	0	0	0	
05.03.000.01	0	0	0	0	21	0	0	0	0	0	
05.04.002.00	0	0	0	0	0	0	0	0	0	0	
05.06.007.01	0	0	0	0	0	0	0	0	0	0	
05.07.006.00	0	0	0	0	0	0	0	0	0	0	
05.07.006.91	0	0	0	0	0	0	0	0	0	0	
05.07.007.00	0	0	0	0	48	0	0	0	0	0	
05.08.001.02	0	0	0	0	3	0	0	0	0	0	
06.04.001.00	0	0	0	0	0	0	0	0	0	0	
06.06.007.00	0	0	0	0	0	0	0	0	0	0	
07.02.001.00	0	0	0	0	0	0	0	0	0	0	
13.02.002.00	0	0	0	0	0	0	0	0	0	0	
18.04.000.00	0	0	0	0	0	27	0	0	0	0	
18.06.000.00	0	0	0	0	0	1	0	0	0	0	
Total	**0**	**64**	**146**	**142**	**105**	**28**	**0**	**0**	**0**	**0**	**485**
Percent	**0.00%**	**13.2%**	**30.1%**	**29.3%**	**21.6%**	**5.77%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**100%**

Major Taxonomic Group Statistics

Project MWT Summer Biomonitoring
Station Downstream
Stream Rice Brook
Location BD-3
Sample Date 09/18/09

Key	KN-2: Numbers of Organisms										
	COLEOPTERA	DIPTERA	EPHEMEROPTERA	TRICHOPTERA	PLECOPTERA	OLIGOCHAETA	BIVALVIA	MEGALOPTERA	ODONATA	OTHER	TOTAL
02.03.003.00	0	0	0	0	0	0	0	0	0	0	
02.05.005.00	0	1	0	0	0	0	0	0	0	0	
02.05.008.00	0	0	0	0	0	0	0	0	0	0	
02.05.017.00	0	2	0	0	0	0	0	0	0	0	
02.05.018.00	0	0	0	0	0	0	0	0	0	0	
02.05.068.00	0	1	0	0	0	0	0	0	0	0	
02.05.075.00	0	13	0	0	0	0	0	0	0	0	
02.05.076.00	0	1	0	0	0	0	0	0	0	0	
02.05.085.05	0	0	0	0	0	0	0	0	0	0	
02.05.096.00	0	0	0	0	0	0	0	0	0	0	
02.05.110.00	0	0	0	0	0	0	0	0	0	0	
02.05.114.02	0	23	0	0	0	0	0	0	0	0	
02.05.121.00	0	0	0	0	0	0	0	0	0	0	
02.06.001.00	0	0	0	0	0	0	0	0	0	0	
02.14.004.00	0	0	0	0	0	0	0	0	0	0	
02.19.003.00	0	1	0	0	0	0	0	0	0	0	
02.19.006.00	0	5	0	0	0	0	0	0	0	0	
02.19.016.00	0	2	0	0	0	0	0	0	0	0	
02.19.019.00	0	0	0	0	0	0	0	0	0	0	
03.01.001.03	0	0	10	0	0	0	0	0	0	0	
03.01.001.09	0	0	94	0	0	0	0	0	0	0	
03.01.006.93	0	0	5	0	0	0	0	0	0	0	
03.04.005.02	0	0	0	0	0	0	0	0	0	0	
03.06.003.00	0	0	8	0	0	0	0	0	0	0	
03.06.007.00	0	0	1	0	0	0	0	0	0	0	
03.07.005.00	0	0	7	0	0	0	0	0	0	0	
04.03.002.00	0	0	0	0	0	0	0	0	0	0	
04.05.003.00	0	0	0	0	0	0	0	0	0	0	
04.05.006.00	0	0	0	6	0	0	0	0	0	0	
04.05.008.04	0	0	0	48	0	0	0	0	0	0	
04.05.008.07	0	0	0	10	0	0	0	0	0	0	
04.05.008.09	0	0	0	2	0	0	0	0	0	0	
04.07.001.00	0	0	0	1	0	0	0	0	0	0	
04.11.001.00	0	0	0	2	0	0	0	0	0	0	
04.12.002.00	0	0	0	8	0	0	0	0	0	0	
04.16.001.01	0	0	0	2	0	0	0	0	0	0	
04.16.001.03	0	0	0	2	0	0	0	0	0	0	
04.16.001.12	0	0	0	0	0	0	0	0	0	0	
04.14.005.00	0	0	0	0	0	0	0	0	0	0	
04.20.001.00	0	0	0	0	0	0	0	0	0	0	
05.01.000.01	0	0	0	0	0	0	0	0	0	0	
05.02.000.01	0	0	0	0	30	0	0	0	0	0	
05.03.000.01	0	0	0	0	23	0	0	0	0	0	
05.04.002.00	0	0	0	0	0	0	0	0	0	0	
05.06.007.01	0	0	0	0	1	0	0	0	0	0	
05.07.006.00	0	0	0	0	0	0	0	0	0	0	
05.07.006.91	0	0	0	0	0	0	0	0	0	0	
05.07.007.00	0	0	0	0	30	0	0	0	0	0	
05.08.001.02	0	0	0	0	0	0	0	0	0	0	
06.04.001.00	0	0	0	0	0	0	0	0	0	0	
06.06.007.00	0	0	0	0	0	0	0	0	1	0	
07.02.001.00	0	0	0	0	0	0	0	0	0	0	
13.02.002.00	0	0	0	0	0	0	0	0	0	0	
18.04.000.00	0	0	0	0	0	10	0	0	0	0	
18.06.000.00	0	0	0	0	0	2	0	0	0	0	
Total	**0**	**49**	**125**	**81**	**84**	**12**	**0**	**0**	**1**	**0**	**352**
Percent	**0.00%**	**13.9%**	**35.5%**	**23.0%**	**23.9%**	**3.41%**	**0.00%**	**0.00%**	**0.28%**	**0.00%**	**100%**

Functional Feeding Group Analysis

Project MWT Summer Biomonitoring
Station Downstream
Stream Rice Brook
Location BD-3
Sample Date 09/18/09

Key	KN-1: Numbers of Organisms								KN-2: Numbers of Organisms							
	CG	CF	PRD	SRD	SHR	SCR	No FG Designation	Total	CG	CF	PRD	SRD	SHR	SCR	No FG Designation	Total
02.03.003.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.05.005.00	0	0	0	0	0	0	0		0	0	0	1	0	0	0	
02.05.008.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.05.017.00	3	0	0	0	0	0	0		2	0	0	0	0	0	0	
02.05.018.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.05.068.00	0	0	0	0	0	0	0		1	0	0	0	0	0	0	
02.05.075.00	23	0	0	0	0	0	0		13	0	0	0	0	0	0	
02.05.076.00	3	0	0	0	0	0	0		1	0	0	0	0	0	0	
02.05.085.05	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.05.096.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.05.110.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.05.114.02	11	0	0	0	0	0	0		23	0	0	0	0	0	0	
02.05.121.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.06.001.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.14.004.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
02.19.003.00	0	0	0	0	0	0	0		0	0	1	0	0	0	0	
02.19.006.00	0	0	21	0	0	0	0		0	0	5	0	0	0	0	
02.19.016.00	0	0	0	3	0	0	0		0	0	0	2	0	0	0	
02.19.019.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
03.01.001.03	0	0	0	0	0	0	0		10	0	0	0	0	0	0	
03.01.001.09	120	0	0	0	0	0	0		94	0	0	0	0	0	0	
03.01.006.93	0	0	0	0	0	11	0		0	0	0	0	0	5	0	
03.04.005.02	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
03.06.003.00	1	0	0	0	0	0	0		8	0	0	0	0	0	0	
03.06.007.00	0	0	0	0	0	0	0		0	0	0	0	0	1	0	
03.07.005.00	14	0	0	0	0	0	0		7	0	0	0	0	0	0	
04.03.002.00	0	0	0	0	0	3	0		0	0	0	0	0	0	0	
04.05.003.00	0	2	0	0	0	0	0		0	0	0	0	0	0	0	
04.05.006.00	0	14	0	0	0	0	0		0	6	0	0	0	0	0	
04.05.008.04	0	75	0	0	0	0	0		0	48	0	0	0	0	0	
04.05.008.07	0	17	0	0	0	0	0		0	10	0	0	0	0	0	
04.05.008.09	0	8	0	0	0	0	0		0	2	0	0	0	0	0	
04.07.001.00	0	0	0	5	0	0	0		0	0	0	1	0	0	0	
04.11.001.00	0	0	0	0	0	0	0		0	0	0	0	0	2	0	
04.12.002.00	0	7	0	0	0	0	0		0	8	0	0	0	0	0	
04.16.001.01	0	0	6	0	0	0	0		0	0	2	0	0	0	0	
04.16.001.03	0	0	5	0	0	0	0		0	0	2	0	0	0	0	
04.16.001.12	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
04.14.005.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
04.20.001.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
05.01.000.01	0	0	0	3	0	0	0		0	0	0	0	0	0	0	
05.02.000.01	0	0	30	0	0	0	0		0	0	30	0	0	0	0	
05.03.000.01	0	0	0	21	0	0	0		0	0	0	23	0	0	0	
05.04.002.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
05.06.007.01	0	0	0	0	0	0	0		0	0	1	0	0	0	0	
05.07.006.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
05.07.006.91	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
05.07.007.00	0	0	48	0	0	0	0		0	0	30	0	0	0	0	
05.08.001.02	0	0	0	3	0	0	0		0	0	0	0	0	0	0	
06.04.001.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
06.06.007.00	0	0	0	0	0	0	0		0	0	1	0	0	0	0	
07.02.001.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
13.02.002.00	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
18.04.000.00	27	0	0	0	0	0	0		10	0	0	0	0	0	0	
18.06.000.00	1	0	0	0	0	0	0		2	0	0	0	0	0	0	
Total	**203**	**123**	**110**	**35**	**0**	**14**	**0**	**485**	**171**	**74**	**72**	**27**	**0**	**8**	**0**	**352**
Percent	**41.9%**	**25.4%**	**22.7%**	**7.22%**	**0.00%**	**2.89%**	**0.00%**	**100%**	**48.6%**	**21.0%**	**20.5%**	**7.67%**	**0.00%**	**2.27%**	**0.00%**	**100%**

Functional Feeding Group Analysis

Project MWT Summer Biomonitoring
Station Downstream
Stream Rice Brook
Location BD-3
Sample Date 09/18/09

	Model			Kicknet 1 vs. SHG		Kicknet 2 vs. SHG	
	SHG	MHG	WWMG	KN-1	PPCS	KN-2	PPCS
Col. Gath.	31%	32%	22%	41.9%	74.1%	48.6%	63.8%
Col. Filt.	18%	30%	36%	25.4%	71.0%	21.0%	85.6%
Predator	19%	13%	7%	22.7%	83.8%	20.5%	92.9%
Shred-Det.	15%	4%	2%	7.22%	48.1%	7.67%	51.1%
Shred- Herb.	1%	1%	5%	0.00%	0.00%	0.00%	0.00%
Scraper	12%	13%	22%	2.89%	24.1%	2.27%	18.9%
				PPCS-FG =	50.2%	PPCS-FG =	52.1%

CG = Collector/Gatherer

CF = Collector/Filterer

PRD = Predator

SRD = Shredder - Detritus

SHR = Shredder - Herbivore

SCR = Scraper

Percent Model Affinity of Orders (PMA-O) Calculations

Project MWT Summer Biomonitoring
Station Downstream
Stream Rice Brook **Class** Small, High Gradient, B2-3
Location BD-3
Sample Date 09/18/09 **Sampler** Cathy Szal

Order	Model			Kicknet 1 vs. Model (SHG)		Kicknet 2 vs. Model (SHG)	
	SHG	MHG	WWMG	%	difference	%	difference
Coleoptera	8%	6%	13%	0.00%	8.00	0.00%	8.00
Diptera	19%	18%	13%	13.2%	5.80	13.9%	5.08
Ephemeroptera	23%	34%	32%	30.1%	7.10	35.5%	12.5
Plecoptera	21%	8%	8%	21.6%	0.649	23.9%	2.86
Trichoptera	28%	33%	33%	29.3%	1.28	23.0%	4.99
Oligochaeta	0.5%	0.5%	1.0%	5.77%	5.27	3.41%	2.91
Other	0.5%	0.5%	1.0%	0.00%	0.500	0.28%	0.216
				Sum diff	28.6		36.6
				Sum diff * 0.5	14.3		18.3
				100-(sum diff * 0.5)	85.7		81.7
				% model affinity	**85.7%**		**81.7%**

EPT / EPT+C Calculations

Project MWT Summer Biomonitoring
Station Downstream
Stream Rice Brook
Location BD-3
Sample Date 09/18/09
Class Small, High Gradient, B2-3
Sampler Cathy Szal

	KN-1	KN-2
#EPT organisms	393	290
#C organisms	40	41
EPT/EPT+C	0.91	0.88

Biometric Summary

Project MWT Summer Biomonitoring
Station Downstream
Stream Rice Brook **Class** Small, High Gradient, B2-3
Location BD-3
Sample Date 09/18/09 **Sampler** Cathy Szal

Replicate # Sampling Method	1 KN	2 KN	Average KN
Biometrics:			
Density/Unit	485	352	419
Species Richness	27.0	31.0	29.0
EPT Richness	19.0	19.0	19.0
Old Bio Index (0 to 5)	1.80	1.78	1.79
New Bio Index (0 to 10)	3.19	3.26	3.23
% dominant taxa	24.7%	26.7%	25.7%
EPT/EPT+C	0.908	0.876	0.892
EPT/Richness	0.704	0.613	0.655
% Model Affinity (orders)	85.7%	81.7%	83.7%
PPCS - functional groups	50.2%	52.1%	51.1%
Major Groups:			
Coleoptera (%)	0.00%	0.00%	0.00%
Diptera (%)	13.2%	13.9%	13.6%
Ephemeroptera (%)	30.1%	35.51%	32.81%
Trichoptera (%)	29.3%	23.0%	26.1%
Plecoptera (%)	21.6%	23.9%	22.8%
Oligochaeta (%)	5.77%	3.41%	4.59%
Bivalvia (%)	0.00%	0.00%	0.00%
Megaloptera (%)	0.00%	0.00%	0.00%
Odonata (%)	0.00%	0.28%	0.14%
Other (%)	0.00%	0.00%	0.00%
Total (%)	100%	100%	100%
Feeding Groups:			
Collector Gatherer (%)	41.9%	48.6%	45.2%
Collector Filterer (%)	25.4%	21.0%	23.2%
Predator (%)	22.7%	20.5%	21.6%
Shredder - Detritus (%)	7.22%	7.67%	7.44%
Shredder - Herbivore (%)	0.00%	0.00%	0.00%
Scraper (%)	2.89%	2.27%	2.58%
No FG Designation (%)	0.00%	0.00%	0.00%
Total (%)	100%	100%	100%

Prepared By VHB Pioneer
Project MWT Summer Biomonitoring
Station Downstream **Latitude** 44°8'12.58"N
Stream Rice Brook **Longitude** 72°53'0.38"W
Location BD-3 **Class** Small, High Gradient, B2-3
Sample Date 09/18/09 **Sampler** Cathy Szal

APPLICATION OF STATE OF VERMONT DEC BIOCRITERIA (2/10/04)

Metric	Value	Metric Scoring Results Based on DEC Thresholds for SHG Streams					
		Class B2-3		Class B1		Class A	
		Threshold	Outcome	Threshold	Outcome	Threshold	Outcome
Density	419	≥300	Pass	≥400	I+	≥500	Fail
Richness	29.0	≥27	Pass	≥31	Fail	≥35	Fail
EPT	19.0	≥16	Pass	≥19	I+	≥21	Fail
% PMA-O	83.7%	≥45%	Pass	≥55%	Pass	≥65%	Pass
BI (New 1-10)	3.23	≤4.50	Pass	≤3.50	Pass	≤3.00	I-
% Oligo	4.59%	≤12%	Pass	≤5	I+	≤2	Fail
EPT/EPT+C	0.892	≥0.45	Pass	≥0.55	Pass	≥0.65	Pass
% PPCS-FG	51.1%	≥ 40%	Pass	≥ 45%	Pass	≥ 50%	I+
Outcome:		**Biocriteria are met**					
The following metrics do not meet Class B2-3 thresholds:		NA					

Individual Metric Outcome Guidelines (using the table below)
1) A metric is scored "pass" when the result meets the full support requirements
2) A metric is scored "I+" when the result is between the threshold level and the full support level
3) A metric is scored "I-" when the result is between the threshold level and the non-support level
4) A metric is scored "Fail" when the result is below the non-support requirements

Overall Outcome Guidelines
1) Biocriteria are "met" when: a) five or more metrics are scored "pass" and no metrics have a score of "I-" or "Fail".
2) Biocriteria are "not met" when one or more metrics are scored "failed".
3) In situations where neither items 1 or 2 are the result, an "indeterminate" finding will be made

Scoring Guidelines - Wadeable Stream Category SHG

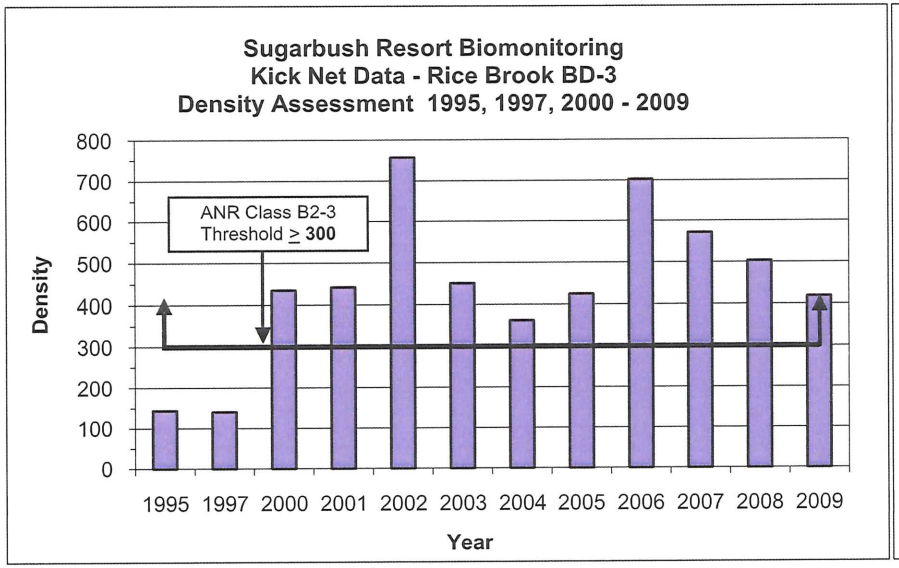
WQ Class	Score	Density	Richness	EPT	PMA-O	BI	% Oligo	EPT/ EPT+C	PPCS-F
A-1	Full Support	>605	>36	>22	>70%	<2.70	<1%	>0.67	>55%
	Threshold	≥500	≥35	≥21	≥65%	≤3	≤2%	≥0.65	≥50%
	Non-Support	<450	<34	<20	<60%	>3.30	>3%	<0.63	<45%
B1	Full Support	>450	>32	>20	>60%	<3.35	<3.5%	>0.57	>50%
	Threshold	≥400	≥31	≥19	≥55%	≤3.5	≤5%	≥0.55	≥45%
	Non-Support	<350	<30	<18	<50%	>3.65	>6.5%	<0.53	<40%
B2-3	Full Support	>350	>28	>17	>50%	<4.35	<9.5%	>0.47	>45%
	Threshold	≥300	≥27	≥16	≥45%	≤4.5	≤12%	≥0.45	≥40%
	Non-Support	<250	<26	<15	<40%	>4.65	>14.5%	<0.43	<35%

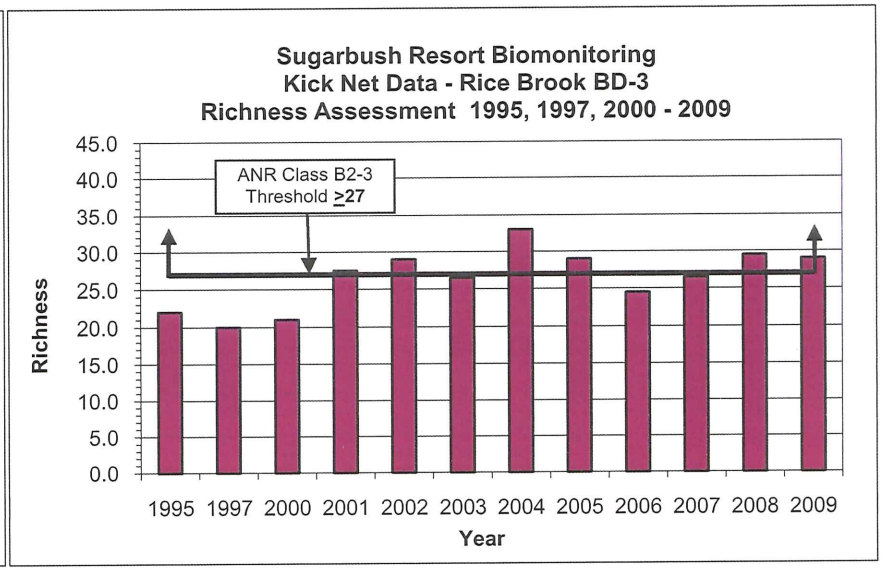
Sugarbush Resort Biomonitoring
Kick Net Data - Rice Brook BD-3
Class B2-3

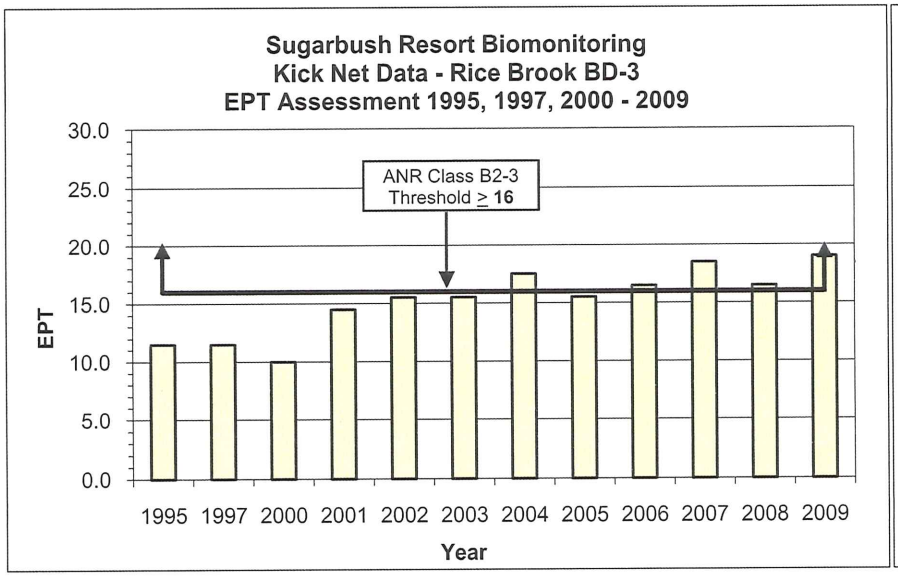
Year	Density	Richness	EPT	% PMA-O	BI	% Oligo.	EPT/EPT +C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥40	
1995	**144**	**22.0**	**11.5**	76.0	1.46	5.20	0.910	48.0	Biocriteria Not Met
1997	**141**	**20.0**	**11.5**	79.0	1.70	**19.5**	0.890	55.0	Biocriteria Not Met
2000	435	**21.0**	**10.00**	70.7	2.31	1.90	0.820	**36.0**	Biocriteria Not Met
2001	442	27.5	**14.5**	66.6	2.78	3.70	0.870	**38.0**	Biocriteria Not Met
2002	757	29.0	**15.5**	68.3	2.73	0.40	0.670	**34.0**	Biocriteria Not Met
2003	451	**26.5**	**15.5**	71.7	1.84	1.30	0.930	41.0	Indeterminate
2004	362	33.0	17.5	80.2	2.02	10.6	0.920	43.0	Biocriteria Met
2005	425	29.0	**15.5**	75.5	3.06	3.70	0.880	52.0	Indeterminate
2006	702	**24.5**	16.5	62.5	3.67	1.17	0.950	**32.9**	Biocriteria Not Met
2007	572	**26.5**	18.5	76.2	3.03	0.17	0.937	54.6	Indeterminate
2008	503	29.5	16.5	76.6	2.59	0.59	0.860	53.5	Biocriteria Met
2009	419	29.0	19.0	83.7	3.23	4.59	0.892	51.1	Biocriteria Met

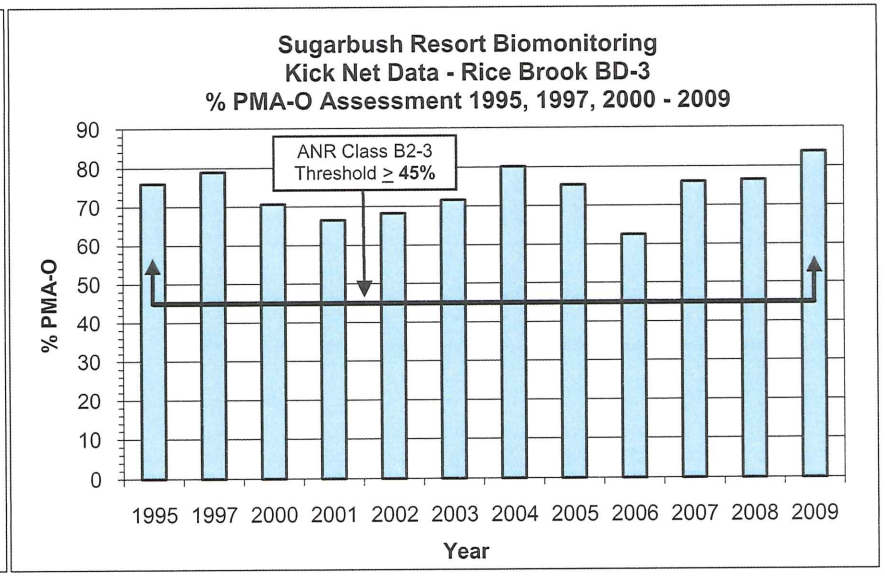
Bold/shade denotes metric did not meet Class B2-3 biocriteria threshold

Sugargush Resort Biomonitoring
Kick Net Data - Rice Brook BD-3
Summary Metric Charts

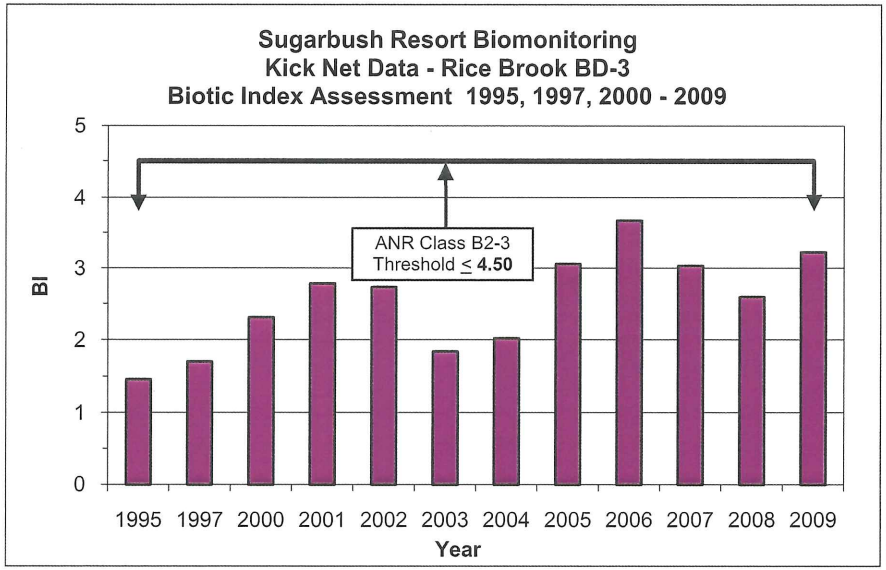


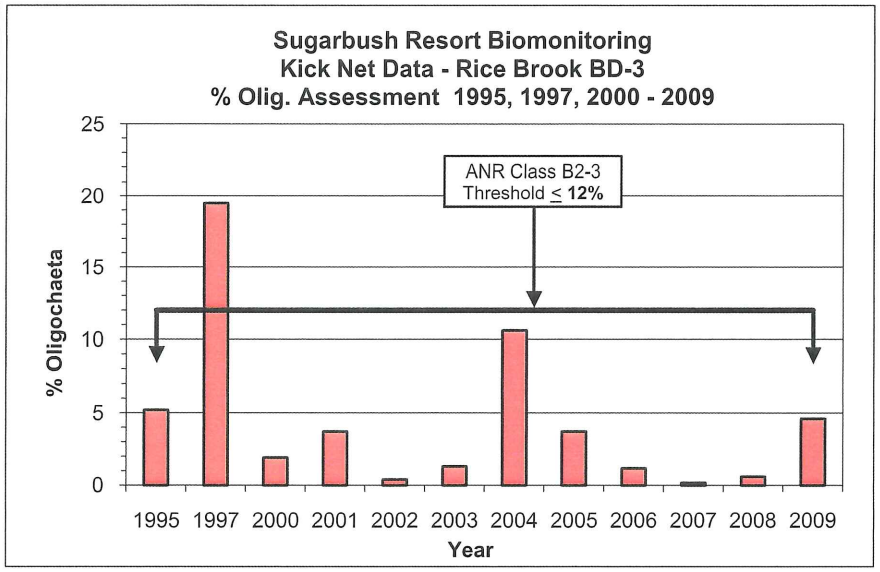


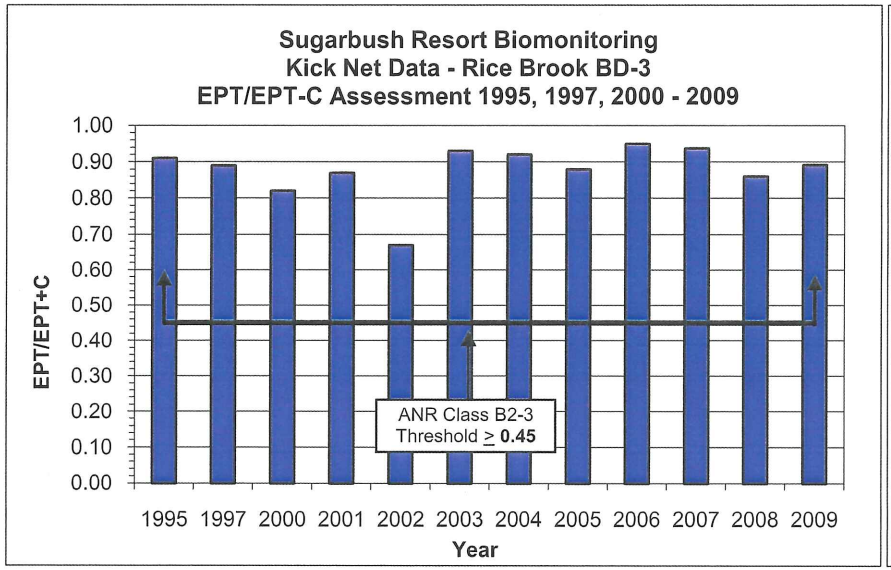


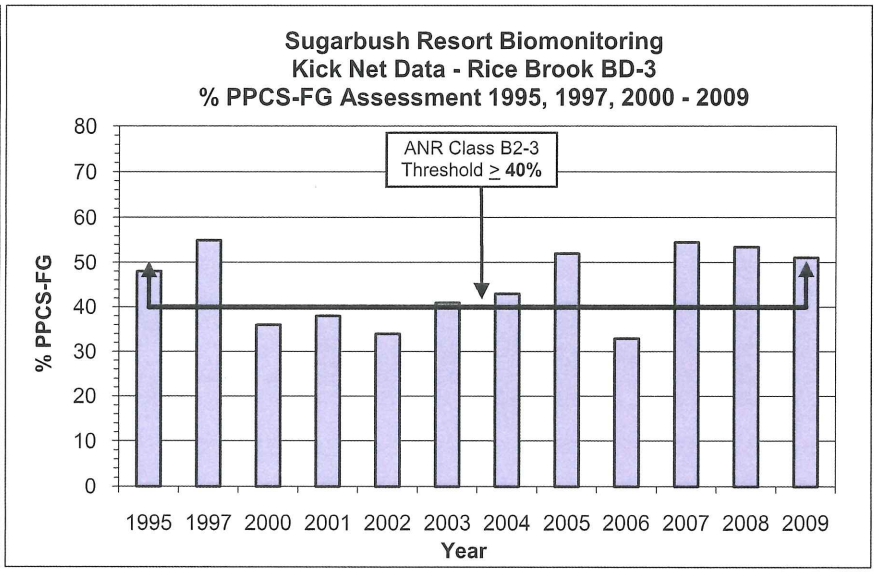


Sugargush Resort Biomonitoring
Kick Net Data - Rice Brook BD-3
Summary Metric Charts









LOTIC BENTHOS FIELD SHEET

Site Location:
River (site) Clay Brook River Mile _____ Site ID BIO 2.1 BioLab ID _____
Town Warren Stream Order _____ Drainage Area _____ Km^2 Elevation 1500 ft
Latitude _____ Longitude _____ Lat/Long source (GPS, USGS Map,Datum) _____
Site Description _____

Sampling Information:
Date 9/20/2009 Time _____ Personnel (circle sampler) Cathy Szal Gear MAS and Kick Net
Effort time (min) 2 Area (m^2) _____ Mesh (um) 590 Quantitative : Y / **N** #Reps 2 Comp/rep 4
Weather sunny Flow/Weather Previous (2 weeks/2days) fairly quiet 2 weeks
Baseflow _____, or Freshet flow _____ Rising / Receding _____ Present Flow: H - **M** - L

General observations circle those that apply: Overall Aesthetic Rating 0 (poor) – 5 (exc.) 3

A: Debris Obvious Pollution: Sludge, Sawdust, Paper Fiber, **Sand, Silt**, Sewage, Oily Sheen, **Trash, Iron**, Scum, None

B: Water Clarity **Clear**, Slightly Turbid, Moderately Turbid, Very Turbid, Secci Tube _____ mm

C: Water Color **Clear**, Green, Milky, Brown (Tannic) L M H, Gray, Metallic, Reddish

D: Odors **None**, Musty, Fishy, Sewage, Manure, Sulfur(eggs), Oily/gas

Embeddedness: 0-5% Excel (5) 5-25% V Good (4) **25-50% Good (3)** 50-75% Fair (2) > 75% Poor (1) Estimate _____ %
Silt rating (0-5) 3 (0=none, 5= high) CPOM rating (leaf packs) (0-5): 2 (0= none,5=high)
Snags/debris dams # 0 / 100 m (reach)

Bank Stability: EX, **G**, F, P; **Riparian Width** (facing upstream) L >100 ft, R >100 ft

% Canopy: 100 90 **80** 70 60 50 40 30 20 10 0 Overhead = Open, Partly Open, or **Closed** *(See back for Densiometer form)*

Vegetation: (both sides) %: Overstory: Softwood 30 Hardwood 70
(Does not need to add up to 100%) %: Understory: Shrub(brush) 10 Grass _____ Herbaceous 10
Surrounding Land Use: Residential, Ski Area, Forest

Periphyton Cover: For each type 0-100% (*See back for Periphyton Cover Form*)
Diatom 50 % Filamentous green _____ % and length _____ (in) Blue Green _____ % Moss Trace % Green _____ %
Other _____ % General Trophic Rating (0-5) 1 (0=oligo, 5=Eutroph)

General Water Type:
Riffle ✓ Winder _____ Other _____ Warm _____ Cold ✓ Mixed _____
B.F.Width 20-30 (ft) Wetted Width 10-15 (ft) Riffle Depth 6-8 (in) Pool Depth 2 (ft) and Obs _____
Velocity (measured): _____ ft/sec, Velocity RANGE-estimate: _____ <0.4 ft/sec (S) ✓ 0.4-2 ft/sec (M) _____ >2 ft/sec (F)
Channelized: Y / **N** Upstream Dam: Y ____ mi / **N** Other modifications: _____

Water Quality Parameters: Field (Record) or Collected (Circle), Meter (type, #) _____ Chemistry LabId _____
Temp Air 60 °F Water 11 °C fpH _____ lab pH _____ fCond _____ labCond _____ *D.O.%* _____ D.Omg/l _____

Cond pH Alkalinity Color _____ *TSS TP DP Cl SO4 Turb TN N02-3 TNH3 DOC Ca Mg Na K Hardness Metals*
Other ____, ____, ____, ____, ____, ____, ____, ____, ____
Field Sheet Complete: CCS (initial) **Photo's:** _____ **Fish Survey Conducted (circle):** Y / **N**

Site Sketch & Observations

Aquatic Biota Observed:

NOTES: Heavy iron staining

Project Summit Ventures NE, LLC
Lincoln Peak IDP
Station Upstream
Stream Clay Brook **Class** Small, High Gradient, B2-3
Location BIO 2.1
Sample Date 09/20/09 **Sampler** Cathy Szal

Taxonomic Data							Biotic Index				Richness Metrics	
							Biotic Index Scores		Old BI (1-5)	New BI (1-10)	Richness	EPT
Key	Order	Genus	Species	# Org's	FFG	Chiro	Old BI	New BI	KN-1	KN-1	KN-1	KN-1
02.03.003.00	DIPTERA	BEZZIA	sp	1	PRD	N	3	6	3	6	1	
02.05.005.00	DIPTERA	BRILLIA	sp	1	SRD	Y	3	5	3	5	1	
02.05.008.00	DIPTERA	CARDIOCLADIUS	sp	1	PRD	Y	3	5	3	5	1	
02.05.075.00	DIPTERA	PARAMETRIOCNEMUS	sp	2	CG	Y	3	5	6	10	1	
02.05.085.05	DIPTERA	POLYPEDILUM	aviceps		CG	Y	3	5	-	-	-	
02.05.110.00	DIPTERA	THIENEMANNEMYIA	sp		PRD	Y	3	6	-	-	-	
02.05.114.02	DIPTERA	TVETENIA	bavarica	5	CG	Y	2	4	10	20	1	
02.05.121.00	DIPTERA	MICROPSECTRA	sp	2	CG	Y	3	6	6	12	1	
02.14.004.00	DIPTERA	PROSIMULIUM	sp	4	CF	N	1	2	4	8	1	
02.19.001.00	DIPTERA	ANTOCHA	sp	1	CG	N	3	3	3	3	1	
02.19.003.00	DIPTERA	DICRANOTA	sp	9	PRD	N	2	3	18	27	1	
02.19.006.00	DIPTERA	HEXATOMA	sp	3	PRD	N	2	2	6	6	1	
02.19.016.00	DIPTERA	TIPULA	sp	3	SRD	N	3	6	9	18	1	
03.01.001.09	EPHEMEROPTERA	BAETIS	tricaudatus	15	CG	N	3	6	45	90	1	1
03.01.006.93	EPHEMEROPTERA	ACENTRELLAPLAUDITUS	sp	5	SCR	N	2	4	10	20	1	1
03.04.005.02	EPHEMEROPTERA	EURYLOPHELLA	funeralis	3	SHR	N	1	0	3	0	1	1
03.06.003.00	EPHEMEROPTERA	EPEORUS	sp	7	CG	N	0	0	0	0	1	1
03.07.005.00	EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	2	CG	N	2	1	4	2	1	1
04.05.006.00	TRICHOPTERA	PARAPSYCHE	sp	3	CF	N	0	0	0	0	1	1
04.05.008.07	TRICHOPTERA	SYMPHITOPSYCHE	sparna		CF	N	2	4	-	-	-	0
04.05.008.09	TRICHOPTERA	SYMPHITOPSYCHE	ventura	1	CF	N	1	3	1	3	1	1
04.07.001.00	TRICHOPTERA	LEPIDOSTOMA	sp	4	SRD	N	1	1	4	4	1	1
04.09.018.00	TRICHOPTERA	PYCNOPSYCHE	sp	1	SRD	N	2	4	2	4	1	1
04.12.002.00	TRICHOPTERA	DOLOPHILODES	sp	1	CF	N	0	0	0	0	1	1
04.14.005.00	TRICHOPTERA	POLYCENTROPUS	sp		PRD	N	3	6	-	-	-	0
04.16.001.01	TRICHOPTERA	RHYACOPHILA	fuscula	6	PRD	N	1	2	6	12	1	1
04.16.001.12	TRICHOPTERA	RHYACOPHILA	invaria	1	PRD	N	1	1	1	1	1	1
05.02.000.01	PLECOPTERA	CHLOROPERLIDAE	imm	57	PRD	N	0	0	0	0	1	1
05.03.000.01	PLECOPTERA	LEUCTRIDAE	imm	90	SRD	N	0	0	0	0	1	1
05.05.001.00	PLECOPTERA	PELTOPERLA	sp	9	SRD	N	1	0	9	0	1	1
05.06.000.00	PLECOPTERA	PERLIDAE	unid		PRD	N	2	3	-	-	-	0
05.07.007.00	PLECOPTERA	MALIREKUS	sp	11	PRD	N	1	2	11	22	1	1
05.08.001.02	PLECOPTERA	PTERONARCYS	proteus	4	SRD	N	1	0	4	0	1	1
18.04.000.00	OLIGOCHAETA	LUMBRICULIDAE	unid	13	CG	N	-	-	-	-	1	
			TOTAL # of Organisms:	**265**			**Total BI Score**		171	278	**Total Richness**	**Total EPT-R**
							Total # Organisms		265	265		
							# of Organisms w/o BI		13	13	29	
							Total # Organisms with BI		252	252		17
							Biotic Index		0.68	1.10		

Major Taxonomic Group Statistics

Project Summit Ventures NE, LLC
Lincoln Peak IDP
Station Upstream
Stream Clay Brook
Location BIO 2.1
Sample Date 09/20/09

Key	KN-1: Numbers of Organisms									
	COLEOPTERA	DIPTERA	EPHEMEROPTERA	TRICHOPTERA	PLECOPTERA	OLIGOCHAETA	BIVALVIA	MEGALOPTERA	ODONATA	TOTAL
02.03.003.00	0	1	0	0	0	0	0	0	0	
02.05.005.00	0	1	0	0	0	0	0	0	0	
02.05.008.00	0	1	0	0	0	0	0	0	0	
02.05.075.00	0	2	0	0	0	0	0	0	0	
02.05.085.05	0	0	0	0	0	0	0	0	0	
02.05.110.00	0	0	0	0	0	0	0	0	0	
02.05.114.02	0	5	0	0	0	0	0	0	0	
02.05.121.00	0	2	0	0	0	0	0	0	0	
02.14.004.00	0	4	0	0	0	0	0	0	0	
02.19.001.00	0	1	0	0	0	0	0	0	0	
02.19.003.00	0	9	0	0	0	0	0	0	0	
02.19.006.00	0	3	0	0	0	0	0	0	0	
02.19.016.00	0	3	0	0	0	0	0	0	0	
03.01.001.09	0	0	15	0	0	0	0	0	0	
03.01.006.93	0	0	5	0	0	0	0	0	0	
03.04.005.02	0	0	3	0	0	0	0	0	0	
03.06.003.00	0	0	7	0	0	0	0	0	0	
03.07.005.00	0	0	2	0	0	0	0	0	0	
04.05.006.00	0	0	0	3	0	0	0	0	0	
04.05.008.07	0	0	0	0	0	0	0	0	0	
04.05.008.09	0	0	0	1	0	0	0	0	0	
04.07.001.00	0	0	0	4	0	0	0	0	0	
04.09.018.00	0	0	0	1	0	0	0	0	0	
04.12.002.00	0	0	0	1	0	0	0	0	0	
04.14.005.00	0	0	0	0	0	0	0	0	0	
04.16.001.01	0	0	0	6	0	0	0	0	0	
04.16.001.12	0	0	0	1	0	0	0	0	0	
05.02.000.01	0	0	0	0	57	0	0	0	0	
05.03.000.01	0	0	0	0	90	0	0	0	0	
05.05.001.00	0	0	0	0	9	0	0	0	0	
05.06.000.00	0	0	0	0	0	0	0	0	0	
05.07.007.00	0	0	0	0	11	0	0	0	0	
05.08.001.02	0	0	0	0	4	0	0	0	0	
18.04.000.00	0	0	0	0	0	13	0	0	0	
Total	**0**	**32**	**32**	**17**	**171**	**13**	**0**	**0**	**0**	**265**
Percent	**0.00%**	**12.1%**	**12.1%**	**6.42%**	**64.5%**	**4.91%**	**0.00%**	**0.00%**	**0.00%**	**100%**

Functional Feeding Group Analysis

Project Summit Ventures NE, LLC
Lincoln Peak IDP
Station Upstream
Stream Clay Brook
Location BIO 2.1
Sample Date 09/20/09

Key	KN-1: Numbers of Organisms						
	CG	CF	PRD	SRD	SHR	SCR	Total
02.03.003.00	0	0	1	0	0	0	
02.05.005.00	0	0	0	1	0	0	
02.05.008.00	0	0	1	0	0	0	
02.05.075.00	2	0	0	0	0	0	
02.05.085.05	0	0	0	0	0	0	
02.05.110.00	0	0	0	0	0	0	
02.05.114.02	5	0	0	0	0	0	
02.05.121.00	2	0	0	0	0	0	
02.14.004.00	0	4	0	0	0	0	
02.19.001.00	1	0	0	0	0	0	
02.19.003.00	0	0	9	0	0	0	
02.19.006.00	0	0	3	0	0	0	
02.19.016.00	0	0	0	3	0	0	
03.01.001.09	15	0	0	0	0	0	
03.01.006.93	0	0	0	0	0	5	
03.04.005.02	0	0	0	0	3	0	
03.06.003.00	7	0	0	0	0	0	
03.07.005.00	2	0	0	0	0	0	
04.05.006.00	0	3	0	0	0	0	
04.05.008.07	0	0	0	0	0	0	
04.05.008.09	0	1	0	0	0	0	
04.07.001.00	0	0	0	4	0	0	
04.09.018.00	0	0	0	1	0	0	
04.12.002.00	0	1	0	0	0	0	
04.14.005.00	0	0	0	0	0	0	
04.16.001.01	0	0	6	0	0	0	
04.16.001.12	0	0	1	0	0	0	
05.02.000.01	0	0	57	0	0	0	
05.03.000.01	0	0	0	90	0	0	
05.05.001.00	0	0	0	9	0	0	
05.06.000.00	0	0	0	0	0	0	
05.07.007.00	0	0	11	0	0	0	
05.08.001.02	0	0	0	4	0	0	
18.04.000.00	13	0	0	0	0	0	
Total	**47**	**9**	**89**	**112**	**3**	**5**	**265**
Percent	**17.7%**	**3.40%**	**33.6%**	**42.3%**	**1.13%**	**1.89%**	**100%**

Functional Feeding Group Analysis

Project Summit Ventures NE, LLC
Lincoln Peak IDP
Station Upstream
Stream Clay Brook
Location BIO 2.1
Sample Date 09/20/09

	Model			Kicknet 1 vs. SHG	
	SHG	**MHG**	**WWMG**	**KN-1**	**PPCS**
Col. Gath.	31%	32%	22%	17.7%	57.2%
Col. Filt.	18%	30%	36%	3.40%	18.9%
Predator	19%	13%	7%	33.6%	56.6%
Shred-Det.	15%	4%	2%	42.3%	35.5%
Shred- Herb.	1%	1%	5%	1.13%	88.3%
Scraper	12%	13%	22%	1.89%	15.7%
				PPCS-FG =	**45.4%**

CG = Collector/Gatherer

CF = Collector/Filterer

PRD = Predator

SRD = Shredder - Detritus

SHR = Shredder - Herbivore

SCR = Scraper

Percent Model Affinity of Orders (PMA-O) Calculations

Project Summit Ventures NE, LLC

Lincoln Peak IDP

Station Upstream

Stream Clay Brook

Location BIO 2.1 **Class** Small, High Gradient, B2-3

Sample Date 09/20/09 **Sampler** Cathy Szal

Order	Model			Kicknet 1 vs. Model (SHG)	
	SHG	MHG	WWMG	%	difference
Coleoptera	8%	6%	13%	0.00%	8.00
Diptera	19%	18%	13%	12.1%	6.92
Ephemeroptera	23%	34%	32%	12.1%	10.9
Plecoptera	21%	8%	8%	64.5%	43.5
Trichoptera	28%	33%	33%	6.42%	21.6
Oligochaeta	0.5%	0.5%	1.0%	4.91%	4.41
Other	0.5%	0.5%	1.0%	0.00%	0.500
				Sum diff	95.9
				Sum diff * 0.5	47.9
				100-(sum diff * 0.5)	52.1
				% model affinity	**52.1%**

EPT / EPT+C Calculations

Project Summit Ventures NE, LLC
Lincoln Peak IDP
Station Upstream
Stream Clay Brook
Location BIO 2.1
Sample Date 09/20/09
Class Small, High Gradient, B2-3
Sampler Cathy Szal

	KN-1
#EPT organisms	220
#C organisms	11
EPT/EPT+C	0.952

Biometrics Summary

Project Summit Ventures NE, LLC
Lincoln Peak IDP
Station Upstream
Stream Clay Brook
Location BIO 2.1 **Class** Small, High Gradient, B2-3
Sample Date 09/20/09 **Sampler** Cathy Szal

Replicate # Sampling Method	1 KN	Average KN
Biometrics:		
Density/Unit	265	265
Species Richness	29.0	29.0
EPT Richness	17.0	17.0
Old Bio Index (0 to 5)	0.679	0.679
New Bio Index (0 to 10)	1.10	1.10
% dominant taxa	34.0%	34.0%
EPT/EPT+C	0.952	0.952
EPT/Richness	0.586	0.586
% Model Affinity (orders)	52.1%	52.1%
PPCS - functional groups	45.4%	45.4%
Major Groups:		
Coleoptera (%)	0.00%	0.00%
Diptera (%)	12.1%	12.1%
Ephemeroptera (%)	12.1%	12.1%
Trichoptera (%)	6.42%	6.42%
Plecoptera (%)	64.5%	64.5%
Oligochaeta (%)	4.91%	4.91%
Bivalvia (%)	0.00%	0.00%
Megaloptera (%)	0.00%	0.00%
Odonata (%)	0.00%	0.00%
Other (%)	0.00%	0.00%
Total (%)	100%	100%
Feeding Groups:		
Collector Gatherer (%)	17.7%	17.7%
Collector Filterer (%)	3.40%	3.40%
Predator (%)	33.6%	33.6%
Shredder - Detritus (%)	42.3%	42.3%
Shredder - Herbivore (%)	1.13%	1.13%
Scraper (%)	1.89%	1.89%
Total (%)	100%	100%

Prepared By VHB Pioneer
Project Summit Ventures NE, LLC
Lincoln Peak IDP
Station Upstream **Latitude** 44°8'7.74"N
Stream Clay Brook **Longitude** 72°53'26"W
Location BIO 2.1 **Class** Small, High Gradient, B2-3
Sample Date 09/20/09 **Sampler** Cathy Szal

APPLICATION OF STATE OF VERMONT DEC BIOCRITERIA (2/10/04)

Metric	Value	Metric Scoring Results Based on DEC Thresholds for SHG Streams					
		Class B2-3		Class B1		Class A	
		Threshold	Outcome	Threshold	Outcome	Threshold	Outcome
Density	265	≥300	I-	≥400	Fail	≥500	Fail
Richness	29.0	≥27	Pass	≥31	Fail	≥35	Fail
EPT	17.0	≥16	Pass	≥19	Fail	≥21	Fail
PMA-O	52.1%	≥45%	Pass	≥55%	I-	≥65%	Fail
BI (New 1-10)	1.10	≤4.50	Pass	≤3.50	Pass	≤3.00	Pass
% Oligo	4.91%	≤12%	Pass	≤5	I+	≤2	Fail
EPT/EPT+C	0.952	≥0.45	Pass	≥0.55	Pass	≥0.65	Pass
PPCS-FG	45.4%	≥ 40%	Pass	≥ 45%	I+	≥ 50%	I-
Outcome:		**Indeterminate**					
The following metrics do not meet Class B2-3 thresholds:		Density (I-)					

Individual Metric Outcome Guidelines (using the table below)
1) A metric is scored "pass" when the result meets the full support requirements
2) A metric is scored "I+" when the result is between the threshold level and the full support level
3) A metric is scored "I-" when the result is between the threshold level and the non-support level
4) A metric is scored "Fail" when the result is below the non-support requirements

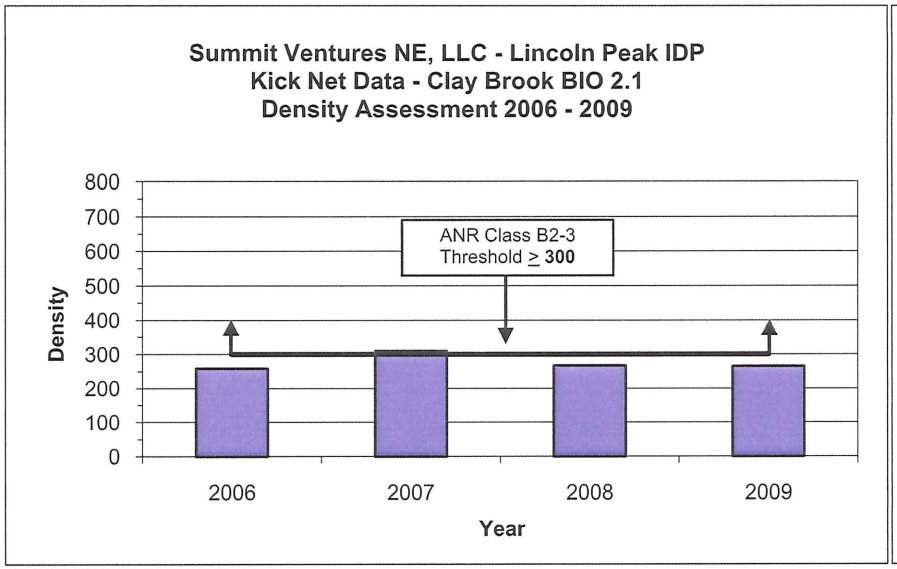
Overall Outcome Guidelines
1) Biocriteria are "met" when: a) five or more metrics are scored "pass" and no metrics have a score of "I-" or "Fail".
2) Biocriteria are "not met" when one or more metrics are scored "failed".
3) In situations where neither items 1 or 2 are the result, an "indeterminate" finding will be made

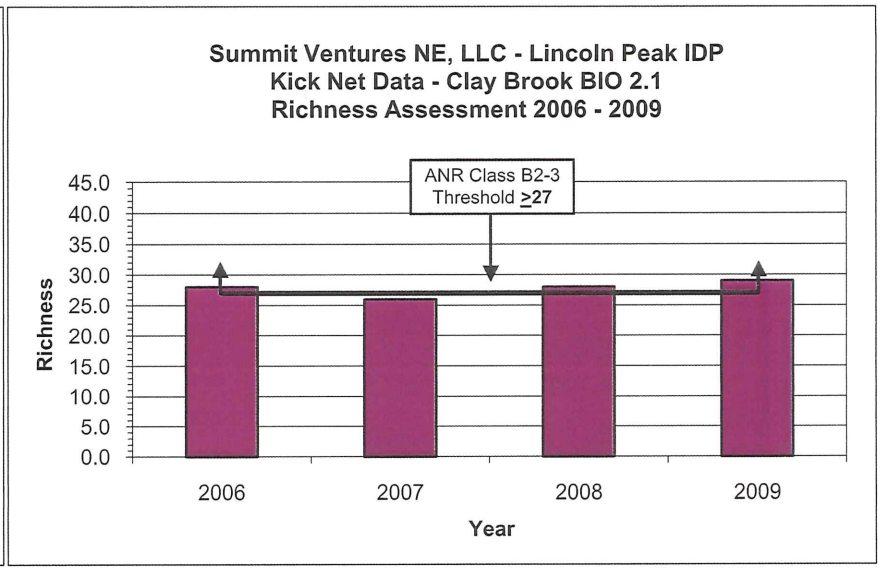
Scoring Guidelines - Wadeable Stream Category SHG

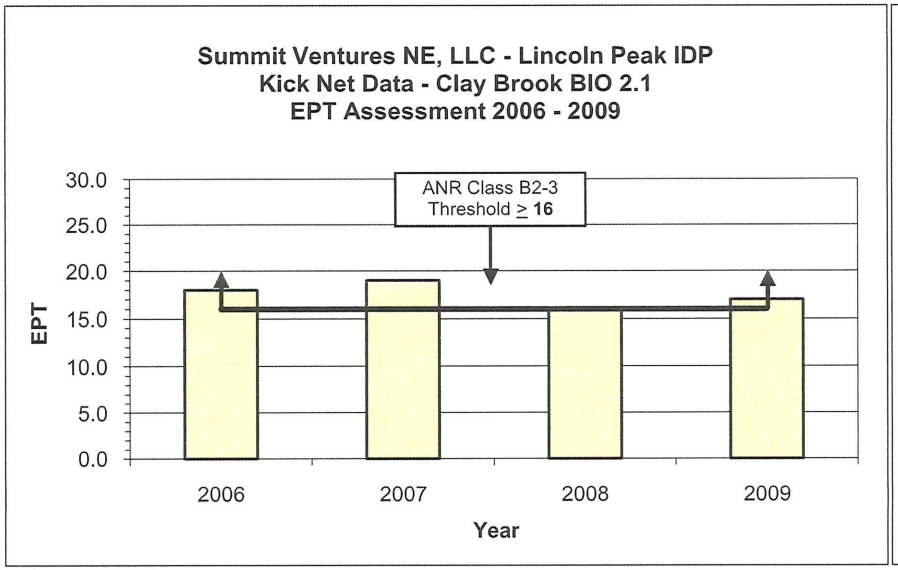
WQ Class	Score	Density	Richness	EPT	PMA-O	BI	% Oligo	EPT/ EPT+C	PPCS-F
A-1	Full Support	>605	>36	>22	>70%	<2.70	<1%	>0.67	>55%
	Threshold	≥500	≥35	≥21	≥65%	≤3	≤2%	≥0.65	≥50%
	Non-Support	<450	<34	<20	<60%	>3.30	>3%	<0.63	<45%
B1	Full Support	>450	>32	>20	>60%	<3.35	<3.5%	>0.57	>50%
	Threshold	≥400	≥31	≥19	≥55%	≤3.5	≤5%	≥0.55	≥45%
	Non-Support	<350	<30	<18	<50%	>3.65	>6.5%	<0.53	<40%
B2-3	Full Support	>350	>28	>17	>50%	<4.35	<9.5%	>0.47	>45%
	Threshold	≥300	≥27	≥16	≥45%	≤4.5	≤12%	≥0.45	≥40%
	Non-Support	<250	<26	<15	<40%	>4.65	>14.5%	<0.43	<35%

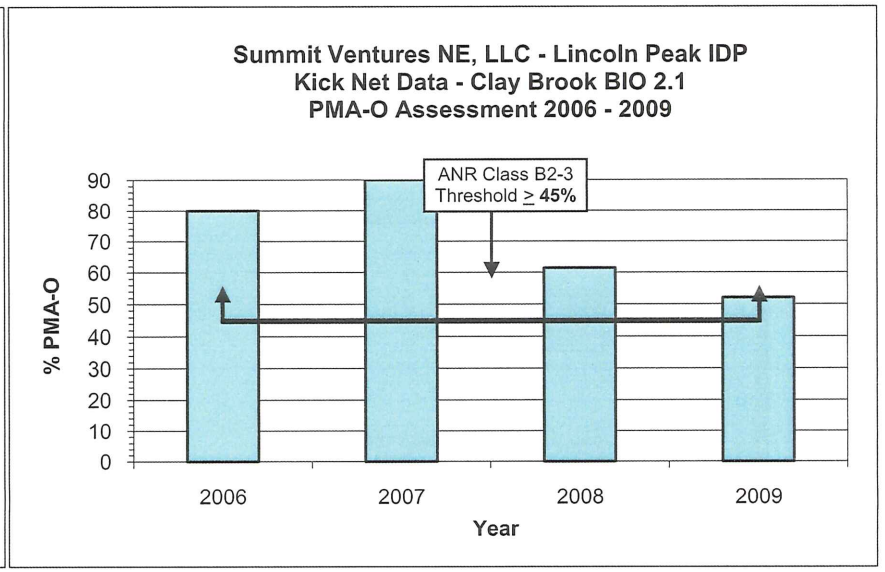
Summit Ventures NE, LLC - Lincoln Peak IDP Kick Net Data - Clay Brook BIO 2.1 (Upstream IDP Station) Class B									
Year	Density	Richness	EPT	% PMA-O	BI	% Oligo.	EPT/EPT+C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45%	≤4.50	≤12%	≥0.45	≥40%	
2006	**258**	28.0	18.0	80.0	1.58	1.16	0.909	53.0	Indeterminate
2007	310	**26.0**	19.0	90.0	1.55	0.00	0.890	70.0	Biocriteria Not Met
2008	**267**	28.0	16.0	61.5	1.26	1.87	0.944	**37.5**	Indeterminate
2009	**265**	29.0	17.0	52.1	1.10	4.91	0.952	45.4	Indeterminate
Bold/shaded denotes metric did not meet Class B2-3 biocriteria threshold									

Summit Ventures NE, LLC - Lincoln Peak IDP
Kick Net Data - Clay Brook BIO 2.1
Summary Metric Charts

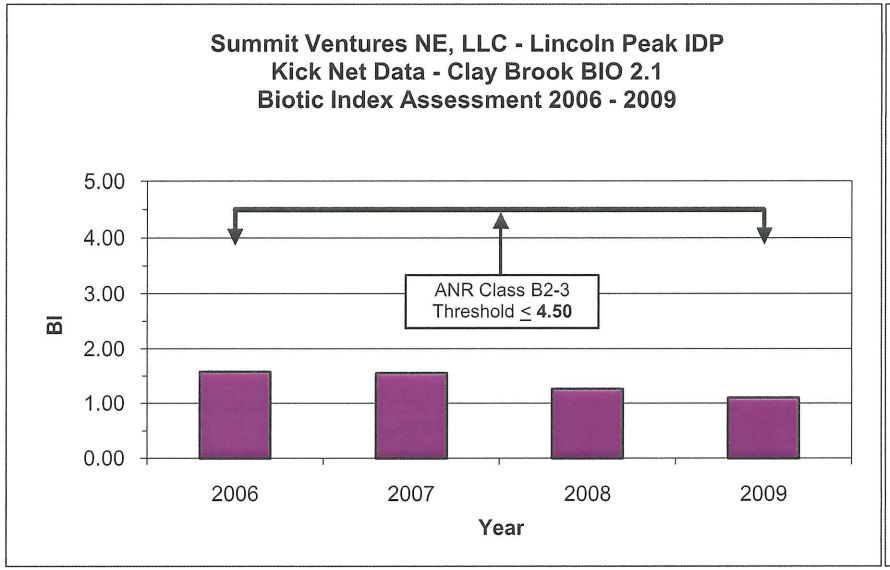


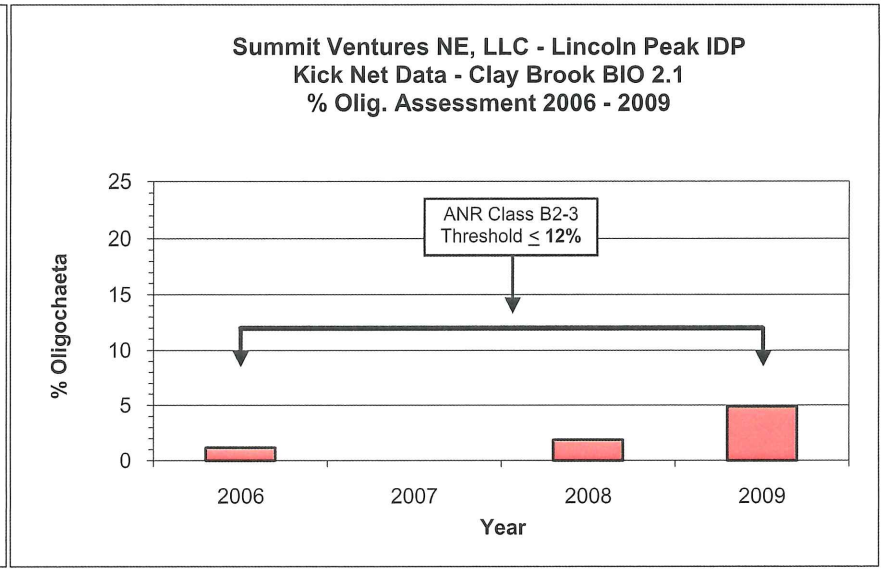


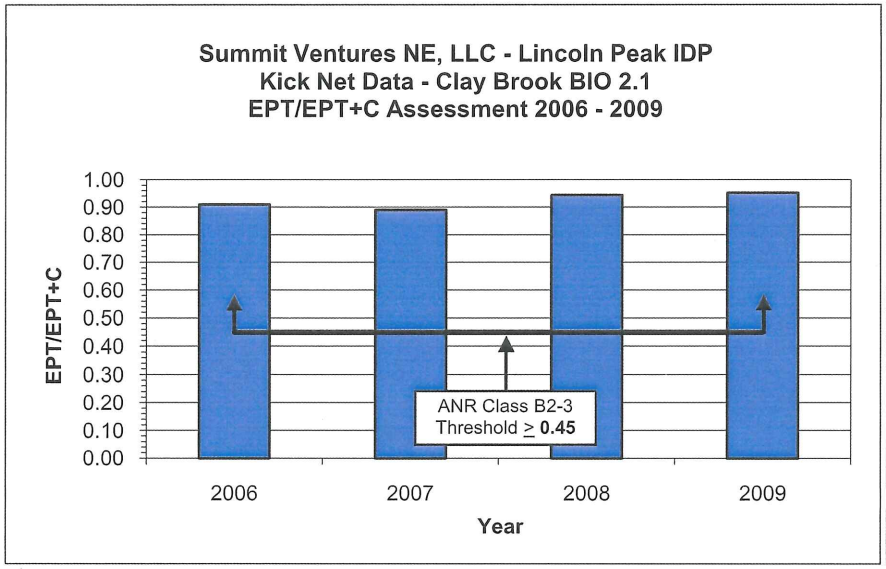


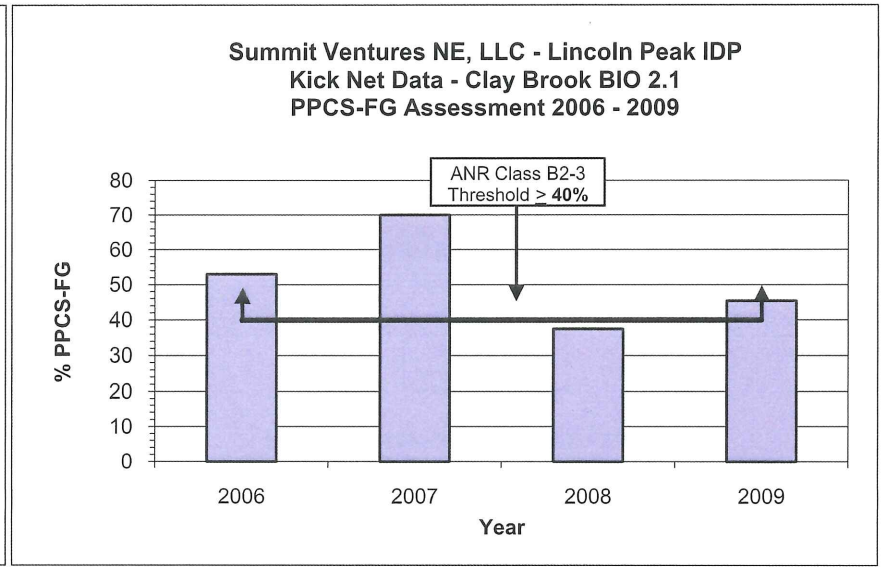


Summit Ventures NE, LLC - Lincoln Peak IDP
Kick Net Data - Clay Brook BIO 2.1
Summary Metric Charts









LOTIC BENTHOS FIELD SHEET

Site Location:
River (site) ____Clay Brook_____River Mile _____Site ID____BIO 2.0___ BioLab ID _____
Town_____Warren_____ Stream Order_____ Drainage Area _____Km² Elevation __1410_ft
Latitude _____ Longitude _____ Lat/Long source (GPS, USGS Map,Datum) _____
Site Description_____

Sampling Information:
Date__9/20/2009__Time_____Personnel (circle sampler)___Cathy Szal___ Gear__MAS and Kick Net___
Effort time (min)__2__Area (m²)_____ Mesh (um)_590___Quantitative : Y / **N** #Reps__2_____Comp/rep __4
Weather_____sunny_____ Flow/Weather Previous (2 weeks/2days)_____fairly quiet 2 weeks
Baseflow_____, or Freshet flow_____ Rising / Receding _____ Present Flow: H - **M** - L

General observations circle those that apply: Overall Aesthetic Rating 0 (poor) – 5 (exc.)__4

A: Debris Obvious Pollution: Sludge, Sawdust, Paper Fiber, **Sand**, Silt, Sewage, Oily Sheen, Trash, **Iron**, Scum, None

B: Water Clarity **Clear**, Slightly Turbid, Moderately Turbid, Very Turbid, Secci Tube_____mm

C: Water Color **Clear**, Green, Milky, Brown (Tannic) L M H , Gray, Metallic, Reddish

D: Odors **None**, Musty, Fishy, Sewage, Manure, Sulfur(eggs), Oily/gas, Humic (blue green algae)

Embeddedness: 0-5% Excel (5) **5-25% V Good (4)** 25-50% Good (3) 50-75% Fair (2) > 75% Poor (1) Estimate_____%
Silt rating (0-5)__3__(0=none, 5= high) CPOM rating (leaf packs) (0-5):__2__(0= none,5=high)
Snags/debris dams #__0__/__100__m (reach)

Bank Stability: EX, **G** , F , P ; **Riparian Width** (facing upstream) L_80_ft, R_>100_ft

% Canopy: 100 90 80 **70** 60 50 40 30 20 10 0 Overhead = Open, **Partly Open**, or Closed *(See back for Densiometer form)*

Vegetation: (both sides) %: Overstory: Softwood __20__Hardwood__80
(Does not need to add up to 100%) %: Understory: Shrub(brush)__20__Grass__10__Herbaceous__20
Surrounding Land Use:__Residential, Ski Area, Forest

Periphyton Cover: For each type 0-100% (*See back for Periphyton Cover Form*)
Diatom __70__% Filamentous green _____% and length _____(in) Blue Green_____Moss __Trace__% Green_____%
Other _____% General Trophic Rating (0-5)__1__(0=oligo, 5=Eutroph)

General Water Type:
Riffle__✓__Winder _____ Other _____ Warm _____ Cold __✓__Mixed _____
B.F.Width__15-20__(ft) Wetted Width__10-15__(ft) Riffle Depth__6-8__(in) Pool Depth__3__(ft) and Obs _____
Velocity (measured):_____ft/sec, Velocity RANGE-estimate: _____ <0.4 ft/sec (S)__✓__ 0.4-2 ft/sec (M) _____ >2 ft/sec (F)
Channelized: Y / **N** Upstream Dam: Y ____mi / **N** Other modifications:_____

Water Quality Parameters: Field (Record) or Collected (Circle), Meter (type, #)_____Chemistry LabId_____
Temp Air__60__°F Water__11__°C fpH_____lab pH_____ fCond_____labCond _____*D.O.%*_____ D.Omg/l_____

*Cond pH Alkalinity Color*_____ *TSS TP DP Cl SO4 Turb TN N02-3 TNH3 DOC Ca Mg Na K Hardness Metals*
*Other*____,____,____,____,____,____,____,____,____,____
Field Sheet Complete:__CCS__(initial) **Photo's:** _____ **Fish Survey Conducted (circle):** Y / **N**

Site Sketch & Observations

Aquatic Biota Observed:

NOTES:

Project Summit Ventures NE, LLC
Lincoln Peak IDP
Station Downstream
Stream Clay Brook **Class** Small, High Gradient, B2-3
Location BIO 2.0
Sample Date 09/20/09 **Sampler** Cathy Szal

Taxonomic Data							Biotic Index				Richness Metrics	
							Biotic Index Scores		Old BI (1-5)	New BI (1-10)	Richness	EPT
Key	Order	Genus	Species	# Org's	FFG	Chiro	Old BI	New BI	KN-1	KN-1	KN-1	KN-1
02.03.003.00	DIPTERA	BEZZIA	sp		PRD	N	3	6	-	-	-	
02.05.005.00	DIPTERA	BRILLIA	sp	1	SRD	Y	3	5	3	5	1	
02.05.008.00	DIPTERA	CARDIOCLADIUS	sp	1	PRD	Y	3	5	3	5	1	
02.05.017.00	DIPTERA	CORYNONEURA	sp	1	CG	Y	2	4	2	4	1	
02.05.038.00	DIPTERA	HELENIELLA	sp	1	-	Y	2	4	2	4	1	
02.05.075.00	DIPTERA	PARAMETRIOCNEMUS	sp	4	CG	Y	3	5	12	20	1	
02.05.085.05	DIPTERA	POLYPEDILUM	aviceps	1	CG	Y	3	5	3	5	1	
02.05.114.02	DIPTERA	TVETENIA	bavarica	2	CG	Y	2	4	4	8	1	
02.05.121.00	DIPTERA	MICROPSECTRA	sp	8	CG	Y	3	6	24	48	1	
02.14.004.00	DIPTERA	PROSIMULIUM	sp	7	CF	N	1	2	7	14	1	
02.19.003.00	DIPTERA	DICRANOTA	sp	17	PRD	N	2	3	34	51	1	
02.19.006.00	DIPTERA	HEXATOMA	sp	2	PRD	N	2	2	4	4	1	
02.19.016.00	DIPTERA	TIPULA	sp		SRD	N	3	6	-	-	-	
03.01.001.03	EPHEMEROPTERA	BAETIS	flavistriga	2	CG	N	3	5	6	10	1	1
03.01.001.09	EPHEMEROPTERA	BAETIS	tricaudatus	72	CG	N	3	6	216	432	1	1
03.01.006.93	EPHEMEROPTERA	ACENTRELLAPLAUDITUS	sp	18	SCR	N	2	4	36	72	1	1
03.04.005.02	EPHEMEROPTERA	EURYLOPHELLA	funeralis	1	SHR	N	1	0	1	0	1	1
03.06.003.00	EPHEMEROPTERA	EPEORUS	sp	19	CG	N	0	0	0	0	1	1
04.05.006.00	TRICHOPTERA	PARAPSYCHE	sp	1	CF	N	0	0	0	0	1	1
04.05.008.04	TRICHOPTERA	SYMPHITOPSYCHE	alhedra	5	CF	N	2	3	10	15	1	1
04.05.008.07	TRICHOPTERA	SYMPHITOPSYCHE	sparna	4	CF	N	2	4	8	16	1	1
04.05.008.09	TRICHOPTERA	SYMPHITOPSYCHE	ventura	5	CF	N	1	3	5	15	1	1
04.07.001.00	TRICHOPTERA	LEPIDOSTOMA	sp	2	SRD	N	1	1	2	2	1	1
04.12.002.00	TRICHOPTERA	DOLOPHILODES	sp	10	CF	N	0	0	0	0	1	1
04.16.001.01	TRICHOPTERA	RHYACOPHILA	fuscula	12	PRD	N	1	2	12	24	1	1
04.16.001.03	TRICHOPTERA	RHYACOPHILA	carolina	1	PRD	N	0	0	0	0	1	1
04.16.001.12	TRICHOPTERA	RHYACOPHILA	invaria	2	PRD	N	1	1	2	2	1	1
05.02.000.01	PLECOPTERA	CHLOROPERLIDAE	imm	78	PRD	N	0	0	0	0	1	1
05.03.000.01	PLECOPTERA	LEUCTRIDAE	imm	72	SRD	N	0	0	0	0	1	1
05.05.001.00	PLECOPTERA	PELTOPERLA	sp		SRD	N	1	0	-	-	-	0
05.06.000.00	PLECOPTERA	PERLIDAE	unid		PRD	N	2	3	-	-	-	0
05.07.007.00	PLECOPTERA	MALIREKUS	sp	14	PRD	N	1	2	14	28	1	1
05.08.001.02	PLECOPTERA	PTERONARCYS	proteus	1	SRD	N	1	0	1	0	1	1
18.04.000.00	OLIGOCHAETA	LUMBRICULIDAE	unid	7	CG	N	-	-	-	-	1	
			TOTAL # of Organisms:	**371**				**Total BI Score**	411	784	**Total**	**Total**
								Total # Organisms	371	371	**Richness**	**EPT-R**
								# of Organisms w/o BI	7	7	30	
								Total # Organisms with BI	364	364		18
								Biotic Index	1.13	2.15		

Major Taxonomic Group Statistics

Project Summit Ventures NE, LLC
Lincoln Peak IDP
Station Downstream
Stream Clay Brook
Location BIO 2.0
Sample Date 09/20/09

Key	KN-1: Numbers of Organisms									
	COLEOPTERA	DIPTERA	EPHEMEROPTERA	TRICHOPTERA	PLECOPTERA	OLIGOCHAETA	BIVALVIA	MEGALOPTERA	ODONATA	TOTAL
02.03.003.00	0	0	0	0	0	0	0	0	0	
02.05.005.00	0	1	0	0	0	0	0	0	0	
02.05.008.00	0	1	0	0	0	0	0	0	0	
02.05.017.00	0	1	0	0	0	0	0	0	0	
02.05.038.00	0	1	0	0	0	0	0	0	0	
02.05.075.00	0	4	0	0	0	0	0	0	0	
02.05.085.05	0	1	0	0	0	0	0	0	0	
02.05.114.02	0	2	0	0	0	0	0	0	0	
02.05.121.00	0	8	0	0	0	0	0	0	0	
02.14.004.00	0	7	0	0	0	0	0	0	0	
02.19.003.00	0	17	0	0	0	0	0	0	0	
02.19.006.00	0	2	0	0	0	0	0	0	0	
02.19.016.00	0	0	0	0	0	0	0	0	0	
03.01.001.03	0	0	2	0	0	0	0	0	0	
03.01.001.09	0	0	72	0	0	0	0	0	0	
03.01.006.93	0	0	18	0	0	0	0	0	0	
03.04.005.02	0	0	1	0	0	0	0	0	0	
03.06.003.00	0	0	19	0	0	0	0	0	0	
04.05.006.00	0	0	0	1	0	0	0	0	0	
04.05.008.04	0	0	0	5	0	0	0	0	0	
04.05.008.07	0	0	0	4	0	0	0	0	0	
04.05.008.09	0	0	0	5	0	0	0	0	0	
04.07.001.00	0	0	0	2	0	0	0	0	0	
04.12.002.00	0	0	0	10	0	0	0	0	0	
04.16.001.01	0	0	0	12	0	0	0	0	0	
04.16.001.03	0	0	0	1	0	0	0	0	0	
04.16.001.12	0	0	0	2	0	0	0	0	0	
05.02.000.01	0	0	0	0	78	0	0	0	0	
05.03.000.01	0	0	0	0	72	0	0	0	0	
05.05.001.00	0	0	0	0	0	0	0	0	0	
05.06.000.00	0	0	0	0	0	0	0	0	0	
05.07.007.00	0	0	0	0	14	0	0	0	0	
05.08.001.02	0	0	0	0	1	0	0	0	0	
18.04.000.00	0	0	0	0	0	7	0	0	0	
Total	**0**	**45**	**112**	**42**	**165**	**7**	**0**	**0**	**0**	**371**
Percent	**0.00%**	**12.1%**	**30.2%**	**11.3%**	**44.5%**	**1.89%**	**0.00%**	**0.00%**	**0.00%**	**100%**

Functional Feeding Group Analysis

Project Summit Ventures NE, LLC
Lincoln Peak IDP
Station Downstream
Stream Clay Brook
Location BIO 2.0
Sample Date 09/20/09

Key	KN-1: Numbers of Organisms							
	CG	CF	PRD	SRD	SHR	SCR	OTHER	Total
02.03.003.00	0	0	0	0	0	0	0	
02.05.005.00	0	0	0	1	0	0	0	
02.05.008.00	0	0	1	0	0	0	0	
02.05.017.00	1	0	0	0	0	0	0	
02.05.038.00	0	0	0	0	0	0	1	
02.05.075.00	4	0	0	0	0	0	0	
02.05.085.05	1	0	0	0	0	0	0	
02.05.114.02	2	0	0	0	0	0	0	
02.05.121.00	8	0	0	0	0	0	0	
02.14.004.00	0	7	0	0	0	0	0	
02.19.003.00	0	0	17	0	0	0	0	
02.19.006.00	0	0	2	0	0	0	0	
02.19.016.00	0	0	0	0	0	0	0	
03.01.001.03	2	0	0	0	0	0	0	
03.01.001.09	72	0	0	0	0	0	0	
03.01.006.93	0	0	0	0	0	18	0	
03.04.005.02	0	0	0	0	1	0	0	
03.06.003.00	19	0	0	0	0	0	0	
04.05.006.00	0	1	0	0	0	0	0	
04.05.008.04	0	5	0	0	0	0	0	
04.05.008.07	0	4	0	0	0	0	0	
04.05.008.09	0	5	0	0	0	0	0	
04.07.001.00	0	0	0	2	0	0	0	
04.12.002.00	0	10	0	0	0	0	0	
04.16.001.01	0	0	12	0	0	0	0	
04.16.001.03	0	0	1	0	0	0	0	
04.16.001.12	0	0	2	0	0	0	0	
05.02.000.01	0	0	78	0	0	0	0	
05.03.000.01	0	0	0	72	0	0	0	
05.05.001.00	0	0	0	0	0	0	0	
05.06.000.00	0	0	0	0	0	0	0	
05.07.007.00	0	0	14	0	0	0	0	
05.08.001.02	0	0	0	1	0	0	0	
18.04.000.00	7	0	0	0	0	0	0	
Total	**116**	**32**	**127**	**76**	**1**	**18**	**1**	**371**
Percent	**31.3%**	**8.63%**	**34.2%**	**20.5%**	**0.27%**	**4.85%**	**0.27%**	**100%**

Functional Feeding Group Analysis

Project Summit Ventures NE, LLC
Lincoln Peak IDP
Station Downstream
Stream Clay Brook
Location BIO 2.0
Sample Date 09/20/09

	Model			Kicknet 1 vs. SHG	
	SHG	MHG	WWMG	KN-1	PPCS
Col. Gath.	31%	32%	22%	31.3%	99.1%
Col. Filt.	18%	30%	36%	8.63%	47.9%
Predator	19%	13%	7%	34.2%	55.5%
Shred-Det.	15%	4%	2%	20.5%	73.2%
Shred- Herb.	1%	1%	5%	0.27%	27.0%
Scraper	12%	13%	22%	4.85%	40.4%
				PPCS-FG =	57.2%

CG = Collector/Gatherer

CF = Collector/Filterer

PRD = Predator

SRD = Shredder - Detritus

SHR = Shredder - Herbivore

SCR = Scraper

Percent Model Affinity of Orders (PMA-O) Calculations

Project Summit Ventures NE, LLC
Lincoln Peak IDP
Station Downstream
Stream Clay Brook
Location BIO 2.0 **Class** Small, High Gradient, B2-3
Sample Date 09/20/09 **Sampler** Cathy Szal

Order	Model			Kicknet 1 vs. Model (SHG)	
	SHG	MHG	WWMG	%	difference
Coleoptera	8%	6%	13%	0.00%	8.00
Diptera	19%	18%	13%	12.1%	6.87
Ephemeroptera	23%	34%	32%	30.2%	7.19
Plecoptera	21%	8%	8%	44.5%	23.5
Trichoptera	28%	33%	33%	11.3%	16.7
Oligochaeta	0.5%	0.5%	1.0%	1.89%	1.39
Other	0.5%	0.5%	1.0%	0.00%	0.500

Sum diff	64.1
Sum diff * 0.5	32.0
100-(sum diff * 0.5)	68.0
% model affinity	**68.0%**

EPT / EPT+C Calculations

Project Summit Ventures NE, LLC
Lincoln Peak IDP
Station Downstream
Stream Clay Brook
Location BIO 2.0
Sample Date 09/20/09
Class Small, High Gradient, B2-3
Sampler Cathy Szal

	KN-1
#EPT organisms	319
#C organisms	19
EPT/EPT+C	0.944

Biometrics Summary

Project Summit Ventures NE, LLC
Lincoln Peak IDP
Station Downstream
Stream Clay Brook
Location BIO 2.0 **Class** Small, High Gradient, B2-3
Sample Date 09/20/09 **Sampler** Cathy Szal

Replicate #	1	Average
Sampling Method	KN	KN
Biometrics:		
Density/Unit	371	371
Species Richness	30.0	30.0
EPT Richness	18.0	18.0
Old Bio Index (0 to 5)	1.13	1.13
New Bio Index (0 to 10)	2.15	2.15
% dominant taxa	21.0%	21.0%
EPT/EPT+C	0.944	0.944
EPT/Richness	0.600	0.600
% Model Affinity (orders)	68.0%	68.0%
PPCS - functional groups	57.2%	57.2%
Major Groups:		
Coleoptera (%)	0.00%	0.00%
Diptera (%)	12.1%	12.1%
Ephemeroptera (%)	30.2%	30.2%
Trichoptera (%)	11.3%	11.3%
Plecoptera (%)	44.5%	44.5%
Oligochaeta (%)	1.89%	1.89%
Bivalvia (%)	0.00%	0.00%
Megaloptera (%)	0.00%	0.00%
Odonata (%)	0.00%	0.00%
Other (%)	0.00%	0.00%
Total (%)	100%	100%
Feeding Groups:		
Collector Gatherer (%)	31.3%	31.3%
Collector Filterer (%)	8.63%	8.63%
Predator (%)	34.2%	34.2%
Shredder - Detritus (%)	20.5%	20.5%
Shredder - Herbivore (%)	0.27%	0.27%
Scraper (%)	4.85%	4.85%
Other (%)	0.27%	0.27%
Total (%)	100%	100%

Prepared By VHB Pioneer
Project Summit Ventures NE, LLC
Lincoln Peak IDP
Station Downstream **Latitude** 44°8'5.23"N
Stream Clay Brook **Longitude** 72°53'9.33"W
Location BIO 2.0 **Class** Small, High Gradient, B2-3
Sample Date 09/20/09 **Sampler** Cathy Szal

APPLICATION OF STATE OF VERMONT DEC BIOCRITERIA (2/10/04)

Metric	Value	Metric Scoring Results Based on DEC Thresholds for SHG Streams					
		Class B2-3		Class B1		Class A	
		Threshold	Outcome	Threshold	Outcome	Threshold	Outcome
Density	371	≥300	Pass	≥400	I-	≥500	Fail
Richness	30.0	≥27	Pass	≥31	Fail	≥35	Fail
EPT	18.0	≥16	Pass	≥19	Fail	≥21	Fail
PMA-O	68.0%	≥45%	Pass	≥55%	Pass	≥65%	I+
BI (New 1-10)	2.15	≤4.50	Pass	≤3.50	Pass	≤3.00	Pass
% Oligo	1.89%	≤12%	Pass	≤5	Pass	≤2	I+
EPT/EPT+C	0.944	≥0.45	Pass	≥0.55	Pass	≥0.65	Pass
PPCS-FG	57.2%	≥ 40%	Pass	≥ 45%	Pass	≥ 50%	Pass
Outcome:		**Biocriteria are met**					
The following metrics do not meet Class B2-3 thresholds:		NA					

Individual Metric Outcome Guidelines (using the table below)
1) A metric is scored "pass" when the result meets the full support requirements
2) A metric is scored "I+" when the result is between the threshold level and the full support level
3) A metric is scored "I-" when the result is between the threshold level and the non-support level
4) A metric is scored "Fail" when the result is below the non-support requirements

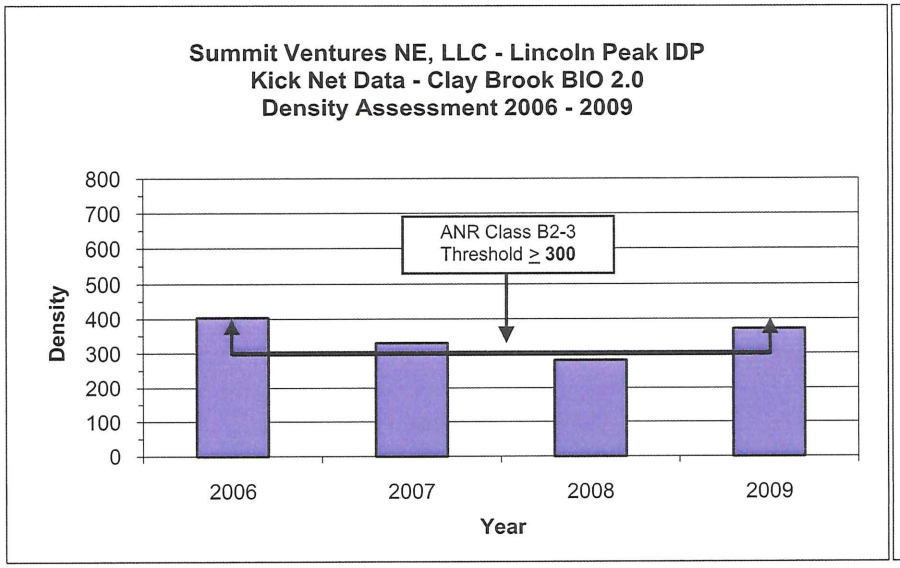
Overall Outcome Guidelines
1) Biocriteria are "met" when: a) five or more metrics are scored "pass" and no metrics have a score of "I-" or "Fail".
2) Biocriteria are "not met" when one or more metrics are scored "failed".
3) In situations where neither items 1 or 2 are the result, an "indeterminate" finding will be made

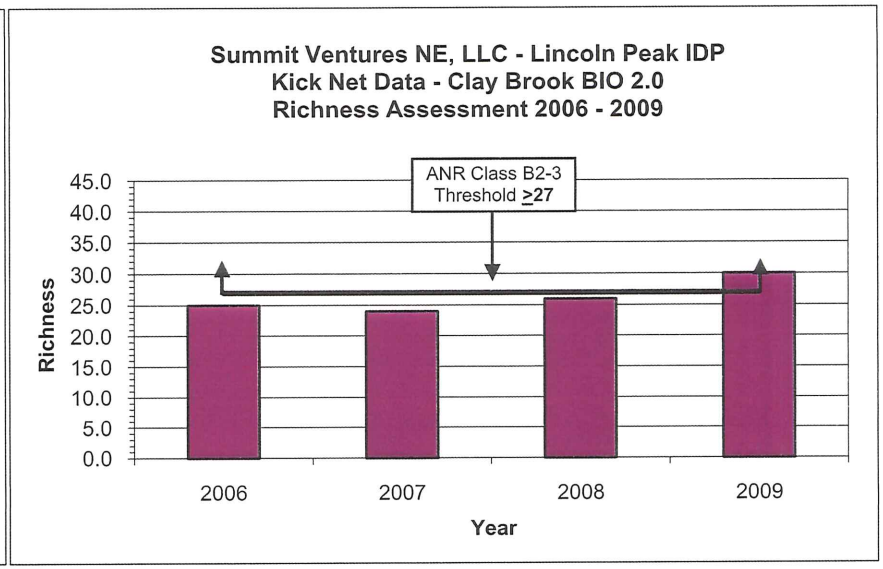
Scoring Guidelines - Wadeable Stream Category SHG

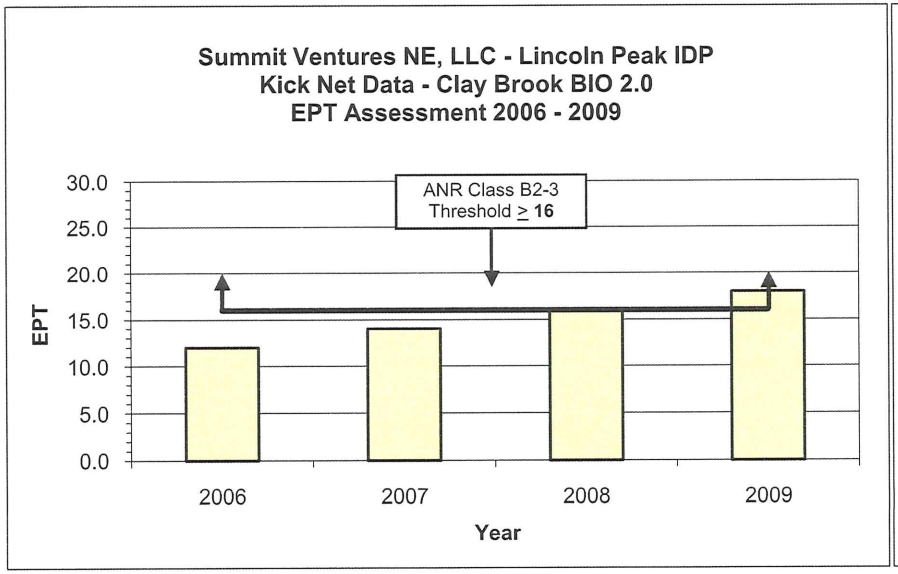
WQ Class	Score	Density	Richness	EPT	PMA-O	BI	% Oligo	EPT/ EPT+C	PPCS-F
A-1	Full Support	>605	>36	>22	>70%	<2.70	<1%	>0.67	>55%
	Threshold	≥500	≥35	≥21	≥65%	≤3	≤2%	≥0.65	≥50%
	Non-Support	<450	<34	<20	<60%	>3.30	>3%	<0.63	<45%
B1	Full Support	>450	>32	>20	>60%	<3.35	<3.5%	>0.57	>50%
	Threshold	≥400	≥31	≥19	≥55%	≤3.5	≤5%	≥0.55	≥45%
	Non-Support	<350	<30	<18	<50%	>3.65	>6.5%	<0.53	<40%
B2-3	Full Support	>350	>28	>17	>50%	<4.35	<9.5%	>0.47	>45%
	Threshold	≥300	≥27	≥16	≥45%	≤4.5	≤12%	≥0.45	≥40%
	Non-Support	<250	<26	<15	<40%	>4.65	>14.5%	<0.43	<35%

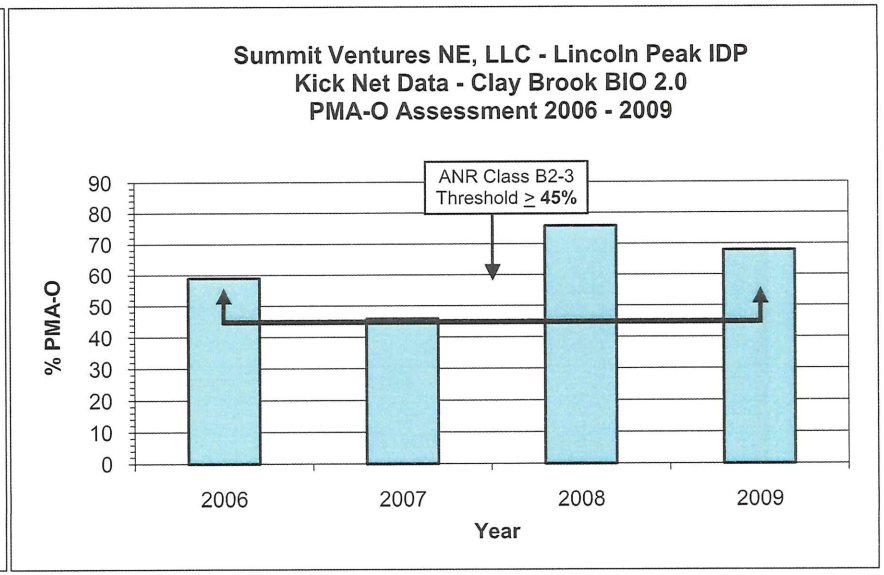
Summit Ventures NE, LLC - Lincoln Peak IDP Kick Net Data - Clay Brook BIO 2.0 (Downstream IDP Station) Class B									
Year	Density	Richness	EPT	% PMA-O	BI	% Oligo.	EPT/EPT+C	% PPCS-FG	Outcome/ Biological Integrity
Class B2-3	≥300	≥27	≥16	≥45%	≤4.50	≤12%	≥0.45	≥40%	
2006	403	**25.0**	**12.0**	59.0	2.56	0.25	0.958	46.0	Biocriteria Not Met
2007	330	**24.0**	**14.0**	46.0	2.29	1.00	0.980	**38.0**	Biocriteria Not Met
2008	**280**	**26.0**	**16.0**	75.8	2.54	1.43	0.930	58.7	Indeterminate
2009	371	30.0	18.0	68.0	2.15	1.89	0.944	57.2	Biocriteria Met
Bold/shaded denotes metric did not meet Class B2-3 biocriteria threshold									

Summit Ventures NE, LLC - Lincoln Peak IDP
Kick Net Data - Clay Brook BIO 2.0
Summary Metric Charts

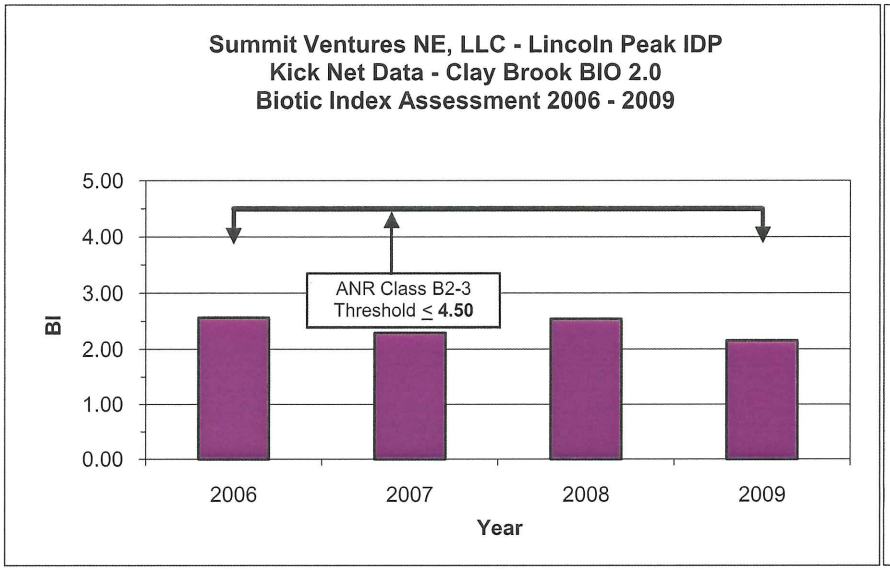


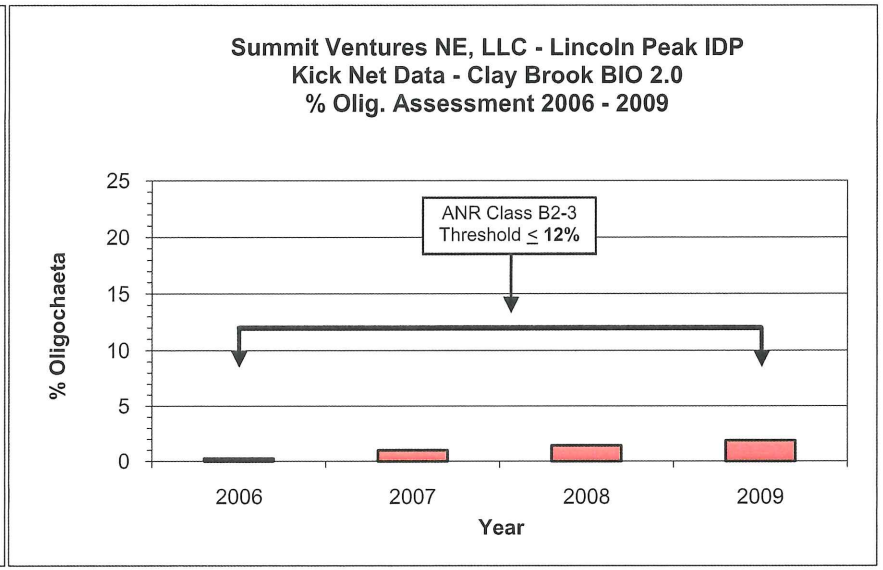


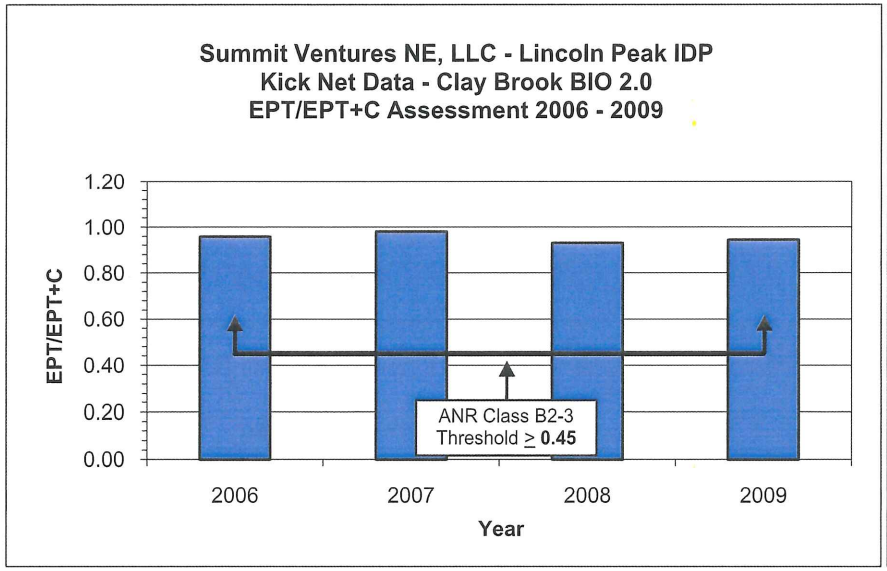


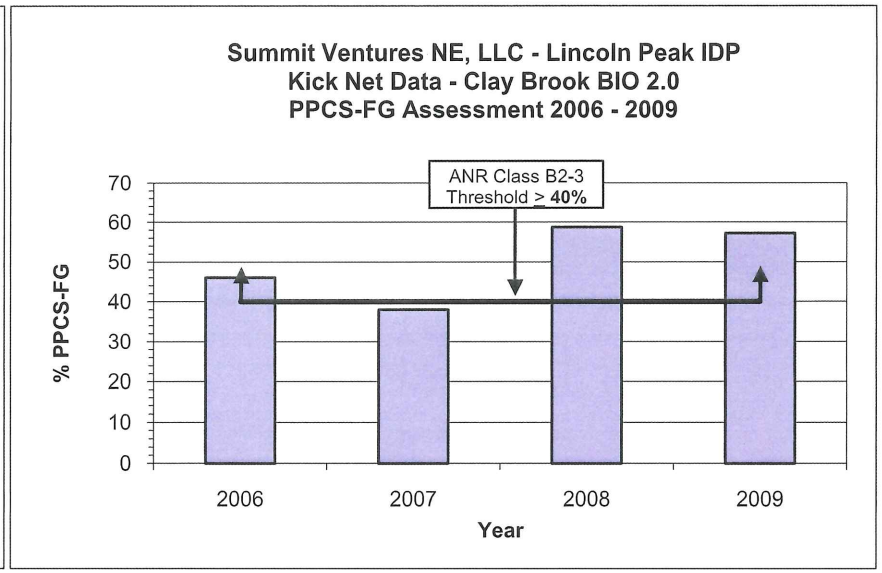


Summit Ventures NE, LLC - Lincoln Peak IDP
Kick Net Data - Clay Brook BIO 2.0
Summary Metric Charts









Sugarbush Resort
Summary of Vermont Water Quality Biocriteria Conformance
Prepared by: VHB Pioneer
Revised: March 4, 2010

Biomonitoring Summary Table - Kicknet Monitoring Results: Conformance with Class B2-3 Bio Criteria															
Watershed	Station	1995	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Rice Brook	BU-5	BNM	BNM	--	--	BNM	BM	BNM	I	I	BM	I	BNM	BM	BM
	BU-1A	BNM	BNM	--	--	BNM	I	BNM	BM	BM	BM	BNM	BNM	BM	BM
	BU-1B	BNM	BNM	BNM	BNM	BNM	BNM	BNM	BNM	BM	BNM	BM	BM	BM	BM
	BD-2	BNM	BNM	BNM	BNM	BNM	I	BNM	BNM	BM	BM	BNM	BM	I	BM
	BD-3	BNM	BNM	BNM	BNM	BNM	BNM	BNM	I	BM	I	BNM	I	BM	BM
Clay Brook	Iron - Upstream	--	--	--	--	--	--	--	--	--	BNM	BNM	BNM	BNM	--
	Iron - Downstream	--	--	--	--	--	--	--	--	--	BNM	BNM	BNM	BNM	--
	BIO 2.1	--	--	--	--	--	--	--	--	--	--	I	BNM	I	I
	BIO 2.0	--	--	--	--	--	--	--	--	--	--	BNM	BNM	I	BM

BM = Biocriteria Met
I = Indeterminate
BNM = Biocriteria Not Met