Bear Creek Environmental

Stowe Mountain Resort
SMR 2000 Community Plan
Water Quality Management Plan

2014 Monitoring Report

June 1, 2015

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Stowe Mountain Resort
Stowe, Vermont

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EXECUTIVE SUMMARY

- Bear Creek Environmental, LLC (BCE) was retained by Stowe Mountain Resort (SMR) to conduct water quality monitoring and sediment assessments in the West Branch of the Little River watershed as part of the SMR Community 2000 Master Development Plan (MDP). The purpose of the water quality monitoring program is to provide information and guidance for water quality protection during construction and development at Spruce Peak.

- BCE monitored water quality at sixteen stream stations during the 2014 monitoring period (June 2014 through May 2015). The monitoring stations are within the vicinity of Spruce Peak and are located within the West Branch of the Little River watershed and Pinnacle Brook watershed. Thirteen years of water quality monitoring have taken place at Stowe Mountain Resort.

- SMR conducted monitoring at all the stations specified in the Settlement Agreement during 2014-2015, and at many supplemental water quality stations. Additionally, samples were collected during runoff events from the outlets of five sediment basins.

- For the 2014-2015 monitoring season, there were four event-based sampling rounds during storm or melt events that resulted in significant runoff. Event-based samples were analyzed for pH, turbidity, conductivity, and temperature. Chloride was also analyzed for samples collected during an April 2015 melt event.

- Turbidity values reported in 2014-2015 were generally low, with the exception of the November 24, 2014 rain and thaw event, although the event did not result in exceptionally high stream flows.

- SMR implemented a plan during the 2012-2013 monitoring period to improve water quality in the West Branch in the vicinity of the Mansfield Base Area. Based on observations during storm events in 2014-2015, these improvements are helping to reduce sediment reaching surface waters. In particular, the small stormwater basins and drainage networks that are treating stormwater onsite are working well. These areas include: 1. Snowplant Workroad Improvements; 2. Midway Lot Stormwater Management System; 3. Workroad Improvements near Barnes Camp Stream Crossing.

- The performance of the larger basins at the resort depends upon the size and timing of the storm event. Samples collected at the Snowmaking Pond outflow had consistently

low turbidity for each event during the 2014-2015 monitoring year. Elevated turbidity was observed at the Big Spruce Basin outlet on two of four monitoring dates. A source of this turbidity may be Ski Club Brook, which flows into the basin and stirs it up during storm events. The Mansfield Basin and Mansfield Exit Basin had turbid outflow on monitoring dates during which snowmelt was occurring. This could be linked to sediment trapped in snow piles at the Mansfield parking lots. The Upper Barnes Camp Basin continues to perform well with the outflow of the basin dissipating into the forest duff rather than discharging directly to the West Branch. The Lower Barnes Camp Basin also performs well, with no discharge to surface waters being reported for three of the four events sampled.

- Naturally occurring mass failures in the West Branch and Big Spruce watersheds are contributing sediment to surface waters during precipitation events. There are two mass failures along the West Branch between the Mansfield base area and the pumphouse. Along Big Spruce Brook, there are seven naturally occurring mass failures between the Spruce Peak Road crossing and the mouth of the brook. The unstable channel and banks along Ski Club Brook are also a sediment source. Ski Club Brook is located almost entirely on privately owned property, which poses challenges to addressing it as a sediment source.

- Macrobenthic sampling to assess the biological integrity of streams within the vicinity of Stowe Mountain Resort took place at seven monitoring stations during fall 2014. The control station, located at the picnic area in Smuggler's Notch, upstream of the Resort on the West Branch, was found to have good biological integrity. This upper station is likely impacted by acid precipitation. Kick net samples were collected by both Bear Creek Environmental and the Vermont DEC at the West Branch station located immediately upstream of the Mansfield basin, and results indicate the biological integrity was in the range of fair to good. The West Branch station below the Mansfield parking lot exit and the station located upstream of the Pinnacle Brook confluence were found to be have good biological integrity. Both Big Spruce stations had low density and richness and did not meet the Class B2-3 biocriteria, with fair to poor biological integrity at the upper station and fair biological integrity at the lower station. Pinnacle Brook, the reference stream, was found to have very good biological integrity in 2014.

- A field reconnaissance of Big Spruce Brook occurred in May 2015 to identify potential conditions and impacts that may be adversely affecting the macrobenthic community in the brook. River scientists observed nineteen iron seeps along the brook between the Spruce Peak Road crossing and the mouth of the brook. Field observations suggest that water chemistry is likely the most important factor influencing the biological community in Big Spruce Brook. Excessive iron in the brook appears to be degrading water quality and the macroinvertebrate community. These iron seeps do not appear to be related to current construction activities at Spruce Peak and likely date back many years. The numerous naturally occurring iron seeps and lack of access (e.g. steep slopes and fragile adjacent environments) make iron seep remediation implausible.

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1.0 INTRODUCTION

Bear Creek Environmental, LLC (BCE) was retained by Stowe Mountain Resort (SMR) to conduct water quality monitoring and sediment assessments in the West Branch of the Little River watershed. This report summarizes the monitoring activities associated with the Water Quality Management Plan (WQMP) from spring 2014 through spring 2015 as part of the SMR Community 2000 Master Development Plan (MDP).

The purpose of the WQMP is to provide information and guidance for water quality protection during construction and development at Spruce Peak. SMR began the implementation of this plan in 1999. One primary objective of the WQMP is to document water quality conditions throughout the implementation of the MDP. Another objective is to show that the MDP will not result in any undue water pollution to the waters of Vermont according to Criterion 1 of Act 250. As part of the MDP, Spruce Peak construction started in 2003. The data collected in summer 2014 through spring 2015 represents the twelfth year of monitoring during construction.

Big Spruce Brook was placed on the Part C of the 2008 Vermont List of Priority Waters by the Agency of Natural Resources (ANR) as in need of further assessment to determine compliance with the Vermont Water Quality Standards (VWQS). In 2010, Big Spruce Brook was moved to

Part B of the Vermont Priority Water List, based on monitoring data from the past four years. Waters listed on Part B are considered impaired, but do not require the development of a Total Maximum Daily Load (TMDL). Rather, the development of a water quality remediation plan is required so that the VWQS are attained. The Agency of Natural Resources issued a 1272 order on May 6, 2010 to serve as a water quality remediation plan to address sources of iron and sediment identified in Big Spruce Brook. (Refer to Appendix 2 of 2010 Monitoring Report; Nealon, 2011)

Spruce Peak Realty is continuing to work with consultants to identify and remediate sources of sediment and iron in the Big Spruce watershed. Bear Creek Environmental completed a walkover of Big Spruce Brook in May 2015, and these observations are provided in the report. The Mount Mansfield Company has initiated an additional evaluation with VHB, Civil Engineering Associates and Bear Creek Environmental to explore options to reduce sedimentation in the Big Spruce watershed in the vicinity of the Sensation Lot, Spruce Peak Road, and from in-channel and bank erosion within Ski Club Brook. The small stream flowing into the Big Spruce Basin, Ski Club Brook, is located primarily on privately owned land. Although adjustments along Ski Club Brook have been identified as a potential sediment source, no remediation work could occur on the brook without the consent, cooperation, and financial participation of the private landowner.

The West Branch was placed on the 2012 list of impaired waters by the ANR. Based on a meeting held between ANR and SMR on March 15, 2012, and written comments dated April 11, 2012, the West Branch was moved to Part B of the Vermont Priority Waters List. A 1272 order was issued by Pete LaFlamme of the ANR on May 3, 2012 to provide steps to be implemented to improve water quality of the West Branch. (Refer to Appendix 2 of 2012 Monitoring Report; Nealon and Kinghorn, 2013).

Construction activities will continue during 2015 and 2016 at Stowe Mountain Resort as part of the SMR 2000 Master Development Plan. According to Rob Apple of Spruce Peak Realty, a number of construction projects are planned for the 2015 construction season. These projects include:

1. Continued construction of the Spruce Adventure Center
2. Construction of new Switchback Subdivision access road and underground utilities (pending final permitting)
3. Initiation of clearing for downhill mountain bike trails on Mansfield (pending Act 250 permitting)
4. Construction and opening of Mansfield Treetop Adventure Course
5. Completion and opening of Mansfield Zip Tour
6. Construction of additional parking lots adjacent to the Midway parking lots (pending permitting)

2.0 STUDY AREA AND METHODLOGY

BCE monitored water quality at sixteen stream stations (see page 1 of Appendix 1) during the 2014 monitoring period. Seven of these monitoring stations were previously selected by Pioneer Environmental Associates, LLC (Pioneer) based on their proximity to construction activities. The rationale for station selection is reported in Pioneer's Quality Assurance Project Plan (QAPP) dated February 2002. Two additional monitoring stations were voluntarily added by Stowe Mountain Resort during the 2006 monitoring period to provide data for the West Branch and Big Spruce Brook. Based on a recommendation from Bear Creek Environmental, turbidity monitoring of the outflow of three sediment basins was added during 2007. A new monitoring station on Big Spruce Brook at river mile 0.7 was added in 2009 to offer background turbidity data immediately upstream of the Big Spruce Basin. In 2010, two stations on Ski Club Brook were added to monitor sediment sources to the Big Spruce sediment basin. A station on the West Branch at river mile 8.8 was added in 2011 to provide a reference/control biomonitoring station upstream of the resort. Stations near the mouth of Gondola Brook and Long Trail Brook and the Mansfield Exit Basin outlet were added during spring 2012 to better understand sediment sources to the West Branch.

In November 2012, SMR submitted a revised Snow Plowing Plan to the Vermont Agency of Natural Resources (VANR) in order to reduce water quality impacts on the West Branch. A

revised monitoring plan, including recommendations from Steve Fiske (DEC), was submitted to VANR in December 2012. The Revised Monitoring Plan added three baseflow monitoring stations (Long Trail Tributary 0.1, Gondola Brook 0.1, and Little Spruce Brook 0.1), removed the total dissolved phosphorus parameter from baseflow samples, and added the chloride parameter to event-based surface water quality sampling. (Refer to Appendix 2 of 2012 Monitoring Report; Nealon and Kinghorn, 2013).

The monitoring stations at Stowe Mountain Resort are located within the West Branch of the Little River watershed and Pinnacle Brook watershed. The drainage areas of the subwatersheds are in include in Table 1.

Table 1. Drainage Ares of Subwatersheds in the Vicinity of SMR

Subwatershed	Description	Drainage Area (Sq. miles)
West Branch	Above confluence with Pinnacle Brook	4.81
Pinnacle Brook	Tributary to West Branch	2.31
Big Spruce Brook	Tributary to West Branch	0.78
Little Spruce Brook	Tributary to Big Spruce Brook	0.12
Ski Club Brook	Tributary to Big Spruce Brook	0.02
Gondola Brook	Tributary to Long Trail Tributary	0.90
Long Trail Tributary	Tributary to West Branch	1.44

The station numbering of the monitoring stations was revised in 2006 to provide a spatial reference to the stations and to be consistent with the methodology that the Vermont Department of Environmental Conservation (DEC) uses for numbering its stations. The first two letters of the station name is short for the surface water: West Branch of Little River (WB), Big Spruce Brook (BS), Little Spruce Brook (LS), Pinnacle Brook (PB), Ski Club Brook (SC), Gondola Brook (GB), and Long Trail Brook (LT). The number in the station name represents the river mile and is the distance from the mouth. The six sediment basin outflow sampling locations are identified as outlets. A brief description of the stations and the rationale for sampling is provided below.

West Branch of Little River above Stowe Mountain Resort - WB8.8: Located behind the picnic area off Route 108 in Smugglers Notch, this upper monitoring station was added in 2011 to provide a local control station upstream of Stowe Mountain Resort.

West Branch of Little River at Barnes Camp - WB8.2: Located upstream of the resort near Barnes Camp, this station offers a background turbidity monitoring station upstream of the Mansfield Basin and development at the Mansfield Base area. This station was added in 2011 to better understand sources of turbidity to station WB8.0.

West Branch of Little River below Long Trail Tributary - WB8.0 (MS-16B): This station on the West Branch is located directly downstream of the intermountain connector lift and upstream of the discharge from the sedimentation basin that treats the stormwater from the Mt. Mansfield parking lot. It was added in 2006, per the recommendation of Steve Fiske, to bracket the Mt. Mansfield sedimentation basin.

West Branch of Little River above Big Spruce Brook - WB7.5 (MS-8): This station is located on the West Branch above the Big Spruce confluence. The station extends from the bridge at the entrance of the resort downstream to the first section of rock riprap. The purpose of sampling WB7.5 is to evaluate the water quality and biological community upstream of the Spruce Hamlet project and the golf course, yet downstream of the Mansfield Basin. Per the Settlement Agreement, sampling at WB7.5 is required annually until the year after completion of build out.

West Branch of Little River below Snowmaking Pond Outlet - WB6.9: This station is located on the West Branch downstream of the snowmaking pond outlet. The station is representative of water quality at the downstream end of the resort.

West Branch of Little River above Pinnacle Brook Confluence - WB6.5 (MS-14): This station on the West Branch is located immediately above the confluence of Pinnacle Brook. The lower West Branch station is located below the Spruce Hamlet development and much of the drainage from the golf course. The Stowe Mountain Resort Settlement Agreement

dated June 13, 2000 specifies that monitoring at WB6.5 be conducted every other year until the year after completion of build-out. SMR has gone beyond this agreement and has sampled WB6.5 annually.

Gondola Brook – GB0.1: The Gondola Brook station is located at the mouth of Gondola Brook, just downstream of the crossing that enters the Mansfield Basin Parking Lot. The station was added in 2012 to better track sources of turbidity. Per the request of the DEC, baseflow water chemistry monitoring was added in 2013 at the mouths of Gondola Brook and Long Trail Brook.

Long Trail Brook – LT0.1: The Long Trail Brook station is located at the mouth of Long Trail Brook, just upstream of the crossing that enters the northernmost parking lot at the resort. The station was added in 2012 to better track sources of turbidity.

Big Spruce Brook below Ski Trails – BS0.9 (MS-9): This station is located on Big Spruce Brook above the golf course limits. BS0.9 acts as the background water chemistry station for the golf course, and is located below the ski and lift construction and existing ski trails. Per the Stowe Mountain Resort Settlement Agreement dated June 13, 2000, no sampling is required at this station during the construction phase.

Big Spruce Brook above basin – BS0.7: Located on Big Spruce above the outlet of the Big Spruce Basin, this station was added voluntarily in 2009 by SMR to provide turbidity data upstream of the basin.

Big Spruce upstream of Club House – BS0.3 (MS-10A): This station on Big Spruce Brook is located immediately downstream of the new golf course bridge and upstream of the confluence with Little Spruce Brook. This station was added voluntarily by Stowe Mountain Resort following a site visit with Steve Fiske (DEC) in July 2006.

Big Spruce at Mouth – BS0.2 (MS-10): Located on Big Spruce Brook above the confluence of the West Branch, BS0.2 covers the area between the bridge crossing at the ski hostel and the bedrock outcrop, which is below the confluence of Little Spruce Brook. BS0.2 serves as

the downstream monitoring station for the golf course. The Stowe Mountain Resort Settlement Agreement dated June 13, 2000 calls for annual monitoring at this station until the year after completion of build-out.

Little Spruce Brook – LS0.1 (MS-11): Located on Little Spruce Brook below the Spruce Hamlet Development, LS0.1 serves as a monitoring station downstream of the Spruce Hamlet Development. Sampling at this station during construction is not required by the Settlement Agreement. Stowe Mountain Resort (SMR) has conducted voluntary monitoring on Little Spruce throughout the construction phase.

Pinnacle Brook Lower– PB0.1 (MS-13): PB0.1 serves as the local/reference site. Below the upper monitoring station, a very small portion of the golf course (holes 7 and 8) drains toward Pinnacle Brook. The stump dump and the gravel pit also are located between the two Pinnacle Brook stations. The stump dump was covered and seeded in August 2006 and the gravel pit was closed off and seeded in August 2006 as well. Although no monitoring of Pinnacle Brook is required by the Stowe Mountain Resort Settlement Agreement dated June 13, 2000 during the construction phase, SMR has voluntarily sampled PB0.1 throughout the construction phase.

Ski Club Brook – SC0.2: The upper Ski Club Brook monitoring station is located near the Ski Club, where a couple of small drainages come together. The station was added in 2010 to provide turbidity data above a steep section of the Spruce Peak Access Road, where road runoff has been a concern.

Ski Club Brook – SC0.1: The lower Ski Club Brook monitoring station is located at the mouth of Ski Club Brook, just upstream of the culvert that passes under the Spruce Peak Access Road to the Big Spruce Basin. The station was added in 2010 to provide turbidity data to better understand the sediment contribution to the basin.

Mt. Mansfield Basin Outlet (OUTLET 1): Outlet 1 drains from the Mansfield sedimentation basin into the West Branch between stations WB8.0 and WB7.5. A mountain

tributary that is piped into the West Branch at this station is also voluntarily monitored during selected events.

Snowmaking Pond Outlet (OUTLET 2): Stormwater is collected from the golf course and other developed areas of the resort and piped to the former snowmaking pond. Outlet 2 drains into the West Branch downstream of the confluence of Big Spruce Brook.

Big Spruce Basin (OUTLET 3): Outlet 3 drains into Big Spruce Brook immediately downstream of BS0.7.

Mount Mansfield Exit Basin (OUTLET 4): Outlet 4 drains from the Mansfield Exit Basin into the West Branch immediately downstream of the access road bridge. The station was added in spring 2012 to better track sources of turbidity. A tributary that is piped into the West Branch at this station is also voluntarily monitored during select events.

Upper Barnes Camp Basin Outlet (OUTLET 5): Outlet 5 drains from the Upper Barnes Camp Basin and is only sampled when there is a discharge to the West Branch. Generally, outflow from the basin dissipates in a drainage swale prior to discharge to the West Branch.

Lower Barnes Camp Basin Outlet (OUTLET 6): Outlet 6 drains from the Lower Barnes Camp Basin and is only sampled when there is a discharge to the West Branch. Generally, outflow from the basin dissipates in the forest duff and only reaches the West Branch during significant precipitation events or under wet conditions.

Table 2 provides a list of monitoring parameters evaluated at the 2014-2015 monitoring stations.

Table 2. 2014-2015 Water Quality Monitoring Stations at Stowe Mountain Resort					
Station	**Location**	**Monitoring Parameter**			
		Baseflow	**Turbidity**	**Sediment (pebble counts)**	**Biomonitoring**
WB8.8	West Branch at picnic area above SMR	+		+	+
WB8.2	West Branch above Barnes Camp		+		
WB8.0 (MS-16B)	West Branch below Barnes Camp	+	+	+	+
WB7.5 (MS-8)	West Branch above Big Spruce	✓	✓	✓	✓
WB6.9	West Branch below snowmaking pond		✓		
WB6.5 (MS-14)	West Branch above Pinnacle Brook confluence	✓		✓	✓
LT0.1	Long Trail Tributary at Mansfield Entrance	X	+		
GB0.1	Gondola Brook at Mansfield Entrance	X	+		
BS0.9 (MS-9)	Big Spruce Brook below ski trails		+		
BS0.7	Big Spruce above Big Spruce Basin		+		
BS0.3 (MS-10A)	Big Spruce upstream of Club House	+	+	+	+
BS0.2 (MS-10)	Big Spruce Brook at mouth	✓	✓	✓	✓
LS0.1 (MS-11)	Little Spruce Brook	X	+		
PB0.1 (MS-13)	Lower Pinnacle Brook	+		+	+
SC0.2	Upper Ski Club Brook		+		
SC0.1	Lower Ski Club Brook		+		
Outlet 1	Mansfield Basin		+		
Outlet 2	Snowmaking Pond		+		
Outlet 3	Big Spruce Basin		+		
Outlet 4	Mansfield Exit Basin		+		
Outlet 5[1]	Upper Barnes Camp Basin		+		
Outlet 6[1]	Lower Barnes Camp Basin		+		

+ - additional voluntary monitoring by Stowe Mountain Resort not required in Settlement Agreement
X - Station added per request of Steve Fiske (email of October 1, 2012)
[1]Basin outlet sampled only if there is a discharge to waters of the state.

Table 3 shows the drainage and approximate elevation of the seven biomonitoring stations.

Table 3. Drainage and Elevation of Biomonitoring Stations			
Station	**Location**	**Drainage Area (sq. mi.)**	**Elevation (feet)**
BS0.3	Big Spruce Brook near Golf Cottage, above Little Spruce Brook	0.73	1470
BS0.2	Big Spruce Brook near Hostel, below Little Spruce Brook	0.76	1420
WB8.8	West Branch at picnic area upstream of resort	1.18	1605
WB8.0	West Branch upstream of Mansfield Basin	2.92	1480
WB7.5	West Branch downstream of Mansfield Basin	3.56	1410
WB 6.5	West Branch above confluence with Pinnacle Brook	4.81	1250
PB0.1	Pinnacle Brook at mouth	2.31	1255

3.0 MOUNT MANSFIELD CLIMATE

The West Branch watershed lies exclusively within the Northern Green Mountains biophysical region. This region is characterized by Thompson and Sorenson (2005) as having high elevations and cool summers. The Green Mountains have a strong influence on the weather, resulting in an abundance of precipitation in the form of both rain and snow. Precipitation within the West Branch watershed averages 53 inches annually (USGS, Scott Olson, pers. comm., 2004). On the top of Mount Mansfield annual precipitation averages over 78 inches. For the 2014 calendar year, 67.5 inches of precipitation was reported at the Mount Mansfield weather station operated by WCAX. Precipitation increases with elevation, at about an inch per 1000 feet of elevation (Wemple, 2002). Mount Mansfield receives more precipitation than most areas of the State. An orographic effect often occurs on Mount Mansfield.

4.0 WEATHER AND FLOW DURING THE 2014-2015 MONITORING PERIOD

Unitized annual peak stream flow values for the period of record from the West Branch and Ranch Brook are presented below in Table 4 and graphed in Figure 1. The unitized peak flow for the West Branch in 2014 was slightly higher than the peak flow in 2013, but not nearly as

high as 2011 or 2010. The Ranch Brook peak flow for 2014 did not exceed that of 2013. Overall, the 2014 annual peak flows on the West Branch and Ranch Brook were slightly above average between 2001 and 2014.

Table 4. Annual Peak Flows
West Branch and Ranch Brook USGS Gaging Stations

Water Year	West Branch		Ranch Brook	
	Date	Unitized Peak Flow (cfs/sq. mi.)	Date	Unitized Peak Flow (cfs/sq. mi.)
2001	Aug. 31, 2001	81.0	Apr. 24, 2001	79.7
2002	May 17, 2002	85.8	Apr. 14, 2002	88.7
2003	Jun. 14, 2003	60.4	Mar. 29, 2003	52.1
2004	Nov. 20, 2003	91.0	Nov. 19, 2003	96.3
2005	Aug. 31, 2005	52.0	Aug. 31, 2005	55.8
2006	May 19, 2006	108.8	May 19, 2006	99.7
2007	Oct. 28, 2006	66.4	Oct. 28, 2006	93.2
2008	Jul. 24, 2008	87.4	Jul. 20, 2008	127.1
2009	May 10, 2009	127.4	May 10, 2009	83.9
2010	**Aug. 04, 2010**	**372.6**	Aug. 04, 2010	95.0
2010	Sep. 30, 2010	233.4	**Sep. 30, 2010**	**297.4**
2011	**Apr. 27, 2011**	**306.2**	**Apr. 27, 2011**	**258.7**
2011	Aug. 28, 2011	204.9	Aug. 28, 2011	121.3
2012	June 27, 2012	60.0	March 08, 2012	42.6
2013	May 23, 2013	135.1	July 4, 2013	205.3
2014	April 15, 2014	141.3*	April 15, 2014	135.3*
Median		89.2		94.7
Mean		126.8		122.6
Maximum	Aug. 04, 2010	372.6	Sep. 30, 2010	297.4

Extreme Peak flow events (>250 cfs/square mi.) in bold font

* Discharge is an estimate

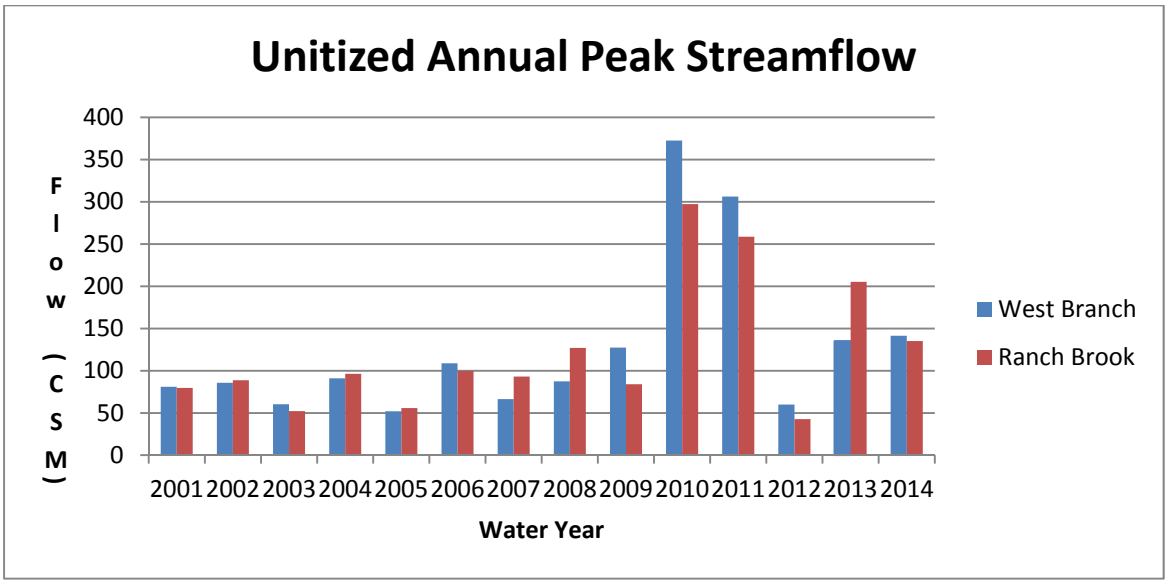

Figure 1. Annual unitized peak stream flow values for the West Branch and Ranch Brook.

Based on data from U.S.G.S., the April 15, 2014 rain and snowmelt event resulted in the peak stream flow values for the year on the West Branch and Ranch Brook. The total precipitation for the event was 1.25 inches (Mark Finch, former golf course superintendent). The peak flow in the West Branch watershed was 660 cfs (141.3 cfs/sq. mile) compared with 514 cfs (135.3 cfs/sq. mile) in the Ranch Brook watershed. These discharge values were estimated by the USGS.

5.0 WATER QUALITY STANDARDS

The Vermont Water Quality Standards (VWQS) (State of Vermont Water Resources Board, effective October 30, 2014) were used to evaluate water quality parameters. Table 5 shows the water quality standards used for comparison in this study. There are no established standards for conductivity or total suspended solids in surface water. Therefore, there are no comparisons against standards for these analytes in the tables and text. According to the VWQS, in general total phosphorus loads should be limited so as not to "contribute to the acceleration of eutrophication or the stimulation of the growth of aquatic biota in a manner that prevents the full support of uses."

Table 5. Vermont Water Quality Standards for Class B Waters	
Parameter	**Standard**
pH	6.5 to 8.5 s.u.
Nitrate-nitrogen	≤ 5.0 mg/L
Total Phosphorus	0.015 mg/L
Turbidity	10 NTU

5.1 Baseflow Sampling Results

Baseflow chemistry monitoring occurred at each macroinvertebrate assessment site during fall 2014. Monitoring parameters included: Alkalinity, pH, chloride, conductivity, nitrate, total Kjeldahl nitrogen (TKN), total phosphorus, conductivity, and water temperature. The results of baseflow water chemistry from 2000 through 2014 are found on pages 2 through 12 of Appendix 1. During 2014, baseflow sampling took place on September 22nd, along with the annual biomonitoring.

Alkalinity

Alkalinity indicates the buffering capacity of water. Aquatic life requires buffering capacity to minimize the impact of acid precipitation. Low alkalinity values, especially those below 4 mg/L as CaCO3, suggest that a stream is critically acidified and the macroinvertebrate community would be likely impacted.

Figure 2 shows the mean alkalinity values for the biomonitoring stations for fall 2003 through fall 2014. Three new stations were added for the 2013 baseflow monitoring year, Gondola Brook, Long Trail Brook, and Little Spruce Brook. All stations had mean alkalinity values of less than 20 mg/L as CaCO3, as shown in Figure 3. The Big Spruce stations have had the highest alkalinity historically; while Pinnacle Brook, Long Trail Brook, Gondola Brook, Little Spruce Brook, and the upper West Branch stations have the lowest. For past years, alkalinity has shown an increasing trend from upstream to downstream on the West Branch. For the September 2014 sampling round, the station on Big Spruce Brook at river mile 0.2 had the highest reported alkalinity value of 35 mg/L as CaCO3, followed by 26

mg/L at BS0.2, and 9.6 mg/L on the West Branch at RM 6.5. The lowest alkalinity value was observed for the station on Long Trail Brook, measuring < 2.0 mg/L as CaCO3. The alkalinity values at stations on Gondola Brook and Pinnacle Brook were also very low, measuring 2.4 mg/L and 2.5 mg/L as CaCO3, respectively. These low alkalinity values suggest that some of the streams at and surrounding Stowe Mountain Resort have a very low buffering capacity and are susceptible to the impacts from acid precipitation.

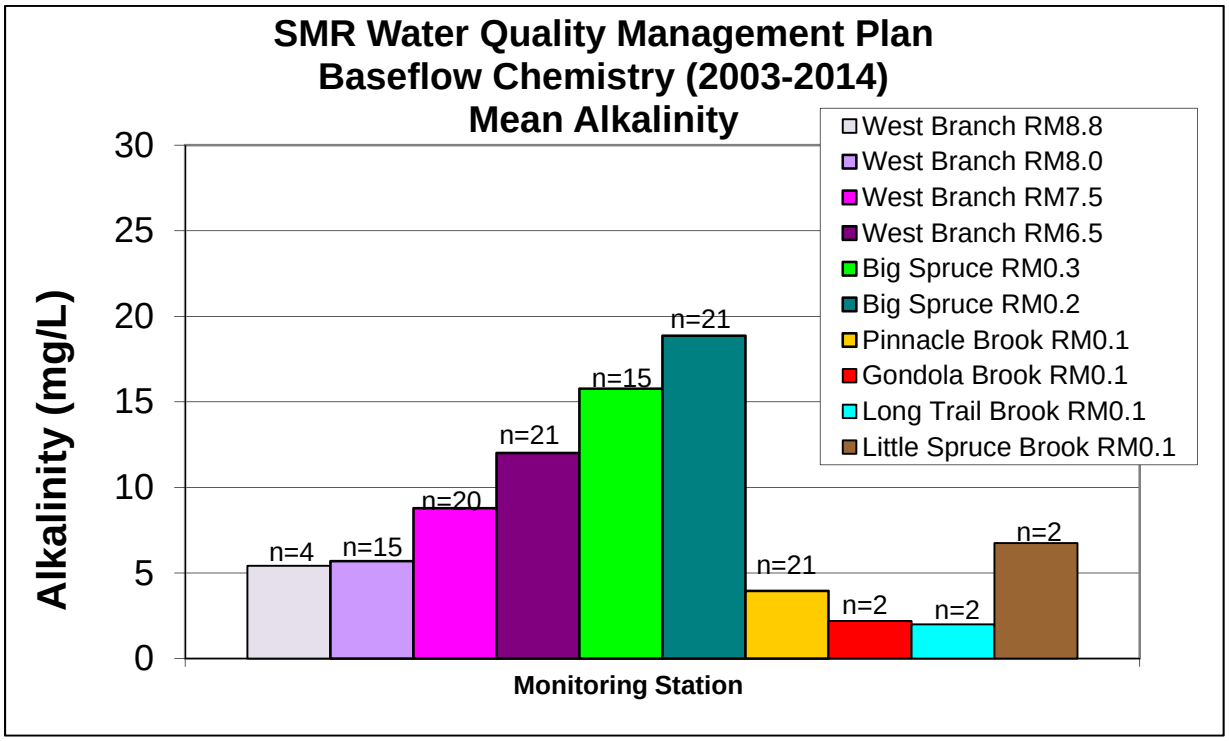

Figure 2. Mean alkalinity for biomonitoring stations.

pH

The pH values for all baseflow samples collected on September 22, 2014 were within the water quality standard limits of 6.5 to 8.5 s.u.

Conductivity

Mean conductivity levels were highest on Little Spruce (only two monitoring years) and at the lower Big Spruce stations. The lowest mean conductivity has been measured on Pinnacle Brook, which is a reflection of its undeveloped watershed. Road salt, dissolved solids, and elevated metals are likely reasons for the higher conductivity values reported for

Little Spruce and Big Spruce Brooks. There is a trend of increasing conductivity on the West Branch and Big Spruce Brook from upstream to downstream.

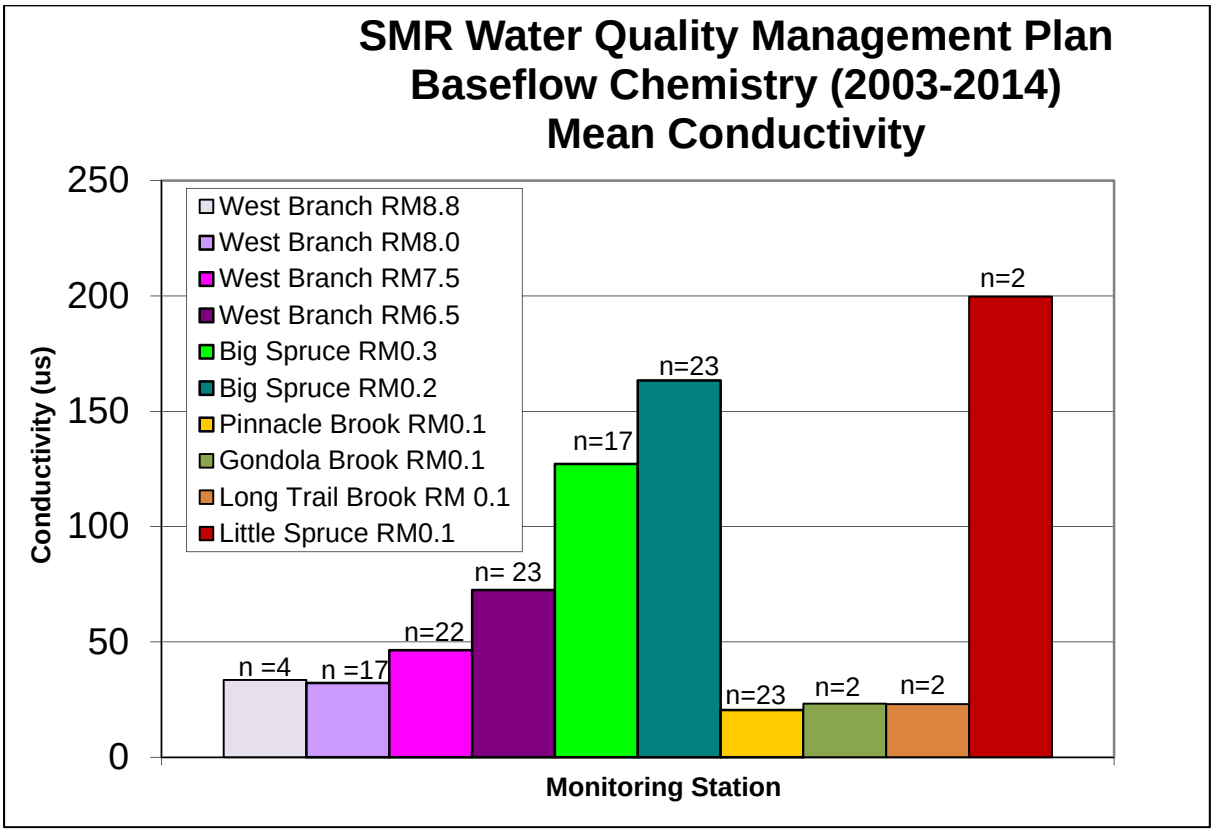

Figure 3. Mean conductivity for biomonitoring stations.

Nutrients

The seven biomonitoring stations, along with the three separate baseflow stations, were monitored for nutrients in 2014. Due to a contamination issue at the lab, total phosphorus was unable to be reported below 0.4 mg/L. All stations were reported as having total phosphorus concentrations of < 0.4mg/L, and thus cannot be evaluated using the Vermont Water Quality Standards.

The results of the monitoring indicate that nitrate-nitrogen concentrations were well below the water quality standard of 5 mg/L at all stations. The highest nitrate concentration reported on September 22, 2014 was 0.46 mg/L at the picnic area in the notch on the upper West Branch (RM8.8), above the Resort.

Iron

Iron seeps in the vicinity of station Big Spruce RM 0.3 have been observed for several years. A remediation of one seep near the station occurred in 2010. This iron seep was located in the vicinity of the resort golf club house, just south of the bridge connecting to the golf course on the east side of the brook. Remediation efforts were successful and the seep is no longer discharging iron. Baseflow monitoring of total iron at the station has occurred each year since the remediation in 2010. The total iron concentration in the baseflow sample at BS 0.3 was highest for 2014 sampling at 0.21 mg/L, followed by 2013 at 0.17 mg/L, 0.071 mg/L in 2010, and 0.054 mg/L in 2011 and 2012. A field reconnaissance of Big Spruce Brook occurred in May 2015, during which nineteen separate iron seeps were identified along the brook between the Spruce Peak Road crossing above the golf course and the confluence of Big Spruce Brook with the West Branch of the Little River. Five of these nineteen iron seeps were identified to be major sources of iron to the brook. Further remediation of iron seeps may not be feasible due to their extent and inaccessible locations.

5.2 Event-based Sampling Results

For the 2014-2015 monitoring season, Bear Creek Environmental, LLC conducted four event-based monitoring rounds (not including two partial rounds on April 16 and 21, 2015). These samples were collected during storm events that resulted in significant runoff (approximately greater than 0.5 inches of rain in 24 hours). In the case of the winter/spring events, sampling coincided with warm temperatures and/or rain that caused a significant snowmelt. Each event-based sample was analyzed for pH, turbidity, conductivity, and temperature. In addition, chloride was analyzed for one of the spring thaw events.

The first of the five event-based sampling rounds for the 2014-2015 monitoring period was completed by Bear Creek Environmental in early summer of 2014. Two sampling rounds took place during fall 2014, and one full and two partial rounds occurred during spring 2015. The results of event-based water chemistry sampling from 2000 through 2015 are found on pages 13 through 39 of Appendix 1. Hourly precipitation data are available from the

weather station at the turf care center for all of the events during the 2014-2015 monitoring period.

June 25, 2014

Bear Creek Environmental, LLC conducted the first round of event-based monitoring on June 25, 2014. The rain started around 1:00 AM in Stowe the morning of the 25th and was heaviest between 8:00 and 10:00 AM. The air temperature during sampling, which occurred between 3:55 PM and 5:00 PM, was in the mid-sixties. The rain mostly tapered off during sampling but picked up again toward the end of sampling. As shown in Figure 4, the total rainfall at the time of sampling was 1.59 inches (Mark Finch, SMR). As shown in Figure 5 below, the West Branch hydrograph peaked at 181 cfs around 10:45 AM on June 25th before sampling, and again at 4:45 PM (145 cfs) during sampling.

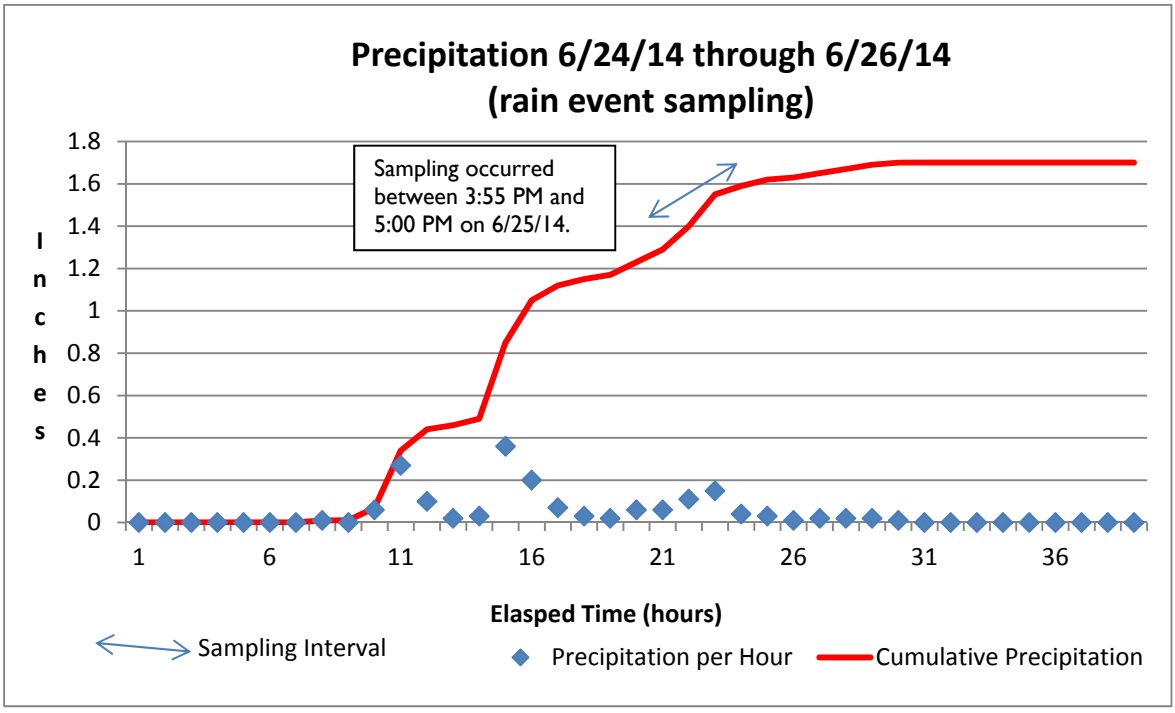

Figure 4. Precipitation for June 25, 2014 event.

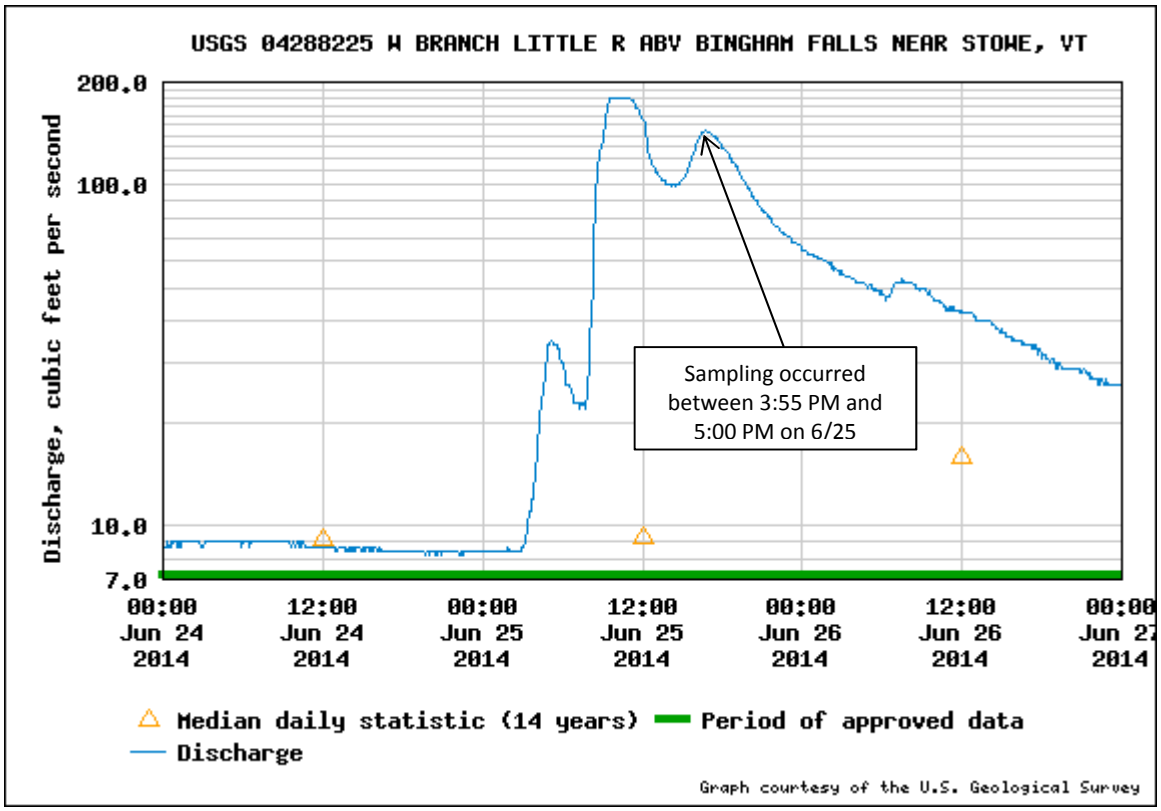

Figure 5. West Branch hydrograph for June 25, 2014 sampling event.

As shown in Figure 6, turbidity values slightly exceeded the water quality standard of 10 NTU at two surface water stations on June 25, 2014. The highest turbidity result was on Little Spruce Brook at RM 0.1 (11.3 NTU), followed by Ski Club Brook downstream at 10.8 NTU. The stream station with the lowest turbidity value was the West Branch at Barnes Camp (RM 8.2), followed by Gondola Brook and the West Branch at WB 7.5. All sediment basin outlets were below 100 NTU as presented in Figure 7. For an event of this magnitude, instream turbidity values were quite low, indicating that erosion and sediment control measures implemented and maintained by the Resort are working effectively.

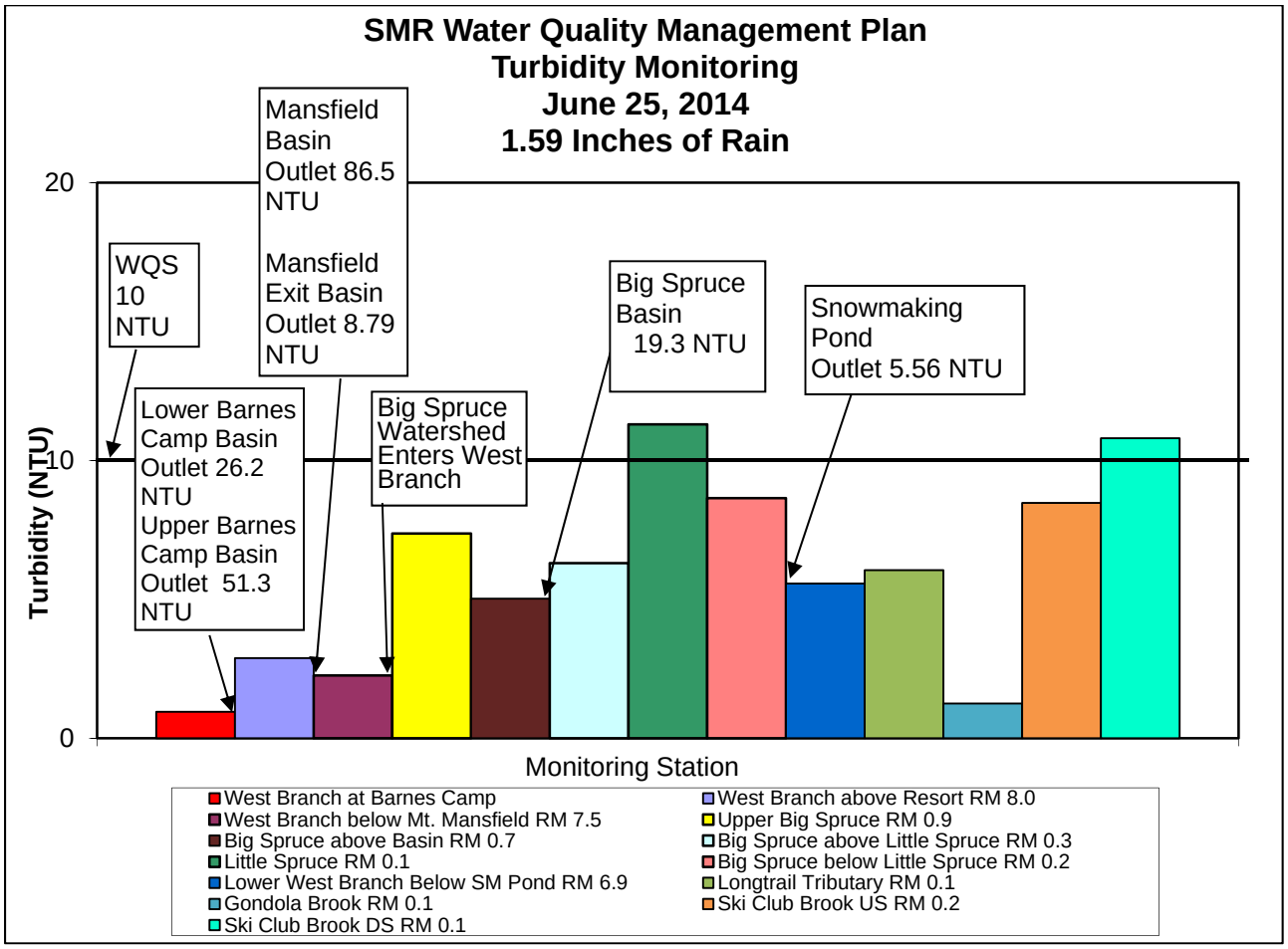

Figure 6. Turbidity results from June 25, 2014.

The highest turbidity value observed at a sediment basin was 86.5 NTU at the Mansfield Basin outlet, followed by the Upper Barnes Camp Basin outlet at 51.3 NTU. The Snowmaking Pond, Big Spruce Basin, and the Mansfield Exit Basin had very low turbidities (less than 10 NTU) at their outlets on June 25, 2014. The range of turbidity values by station for this event is shown on the map.

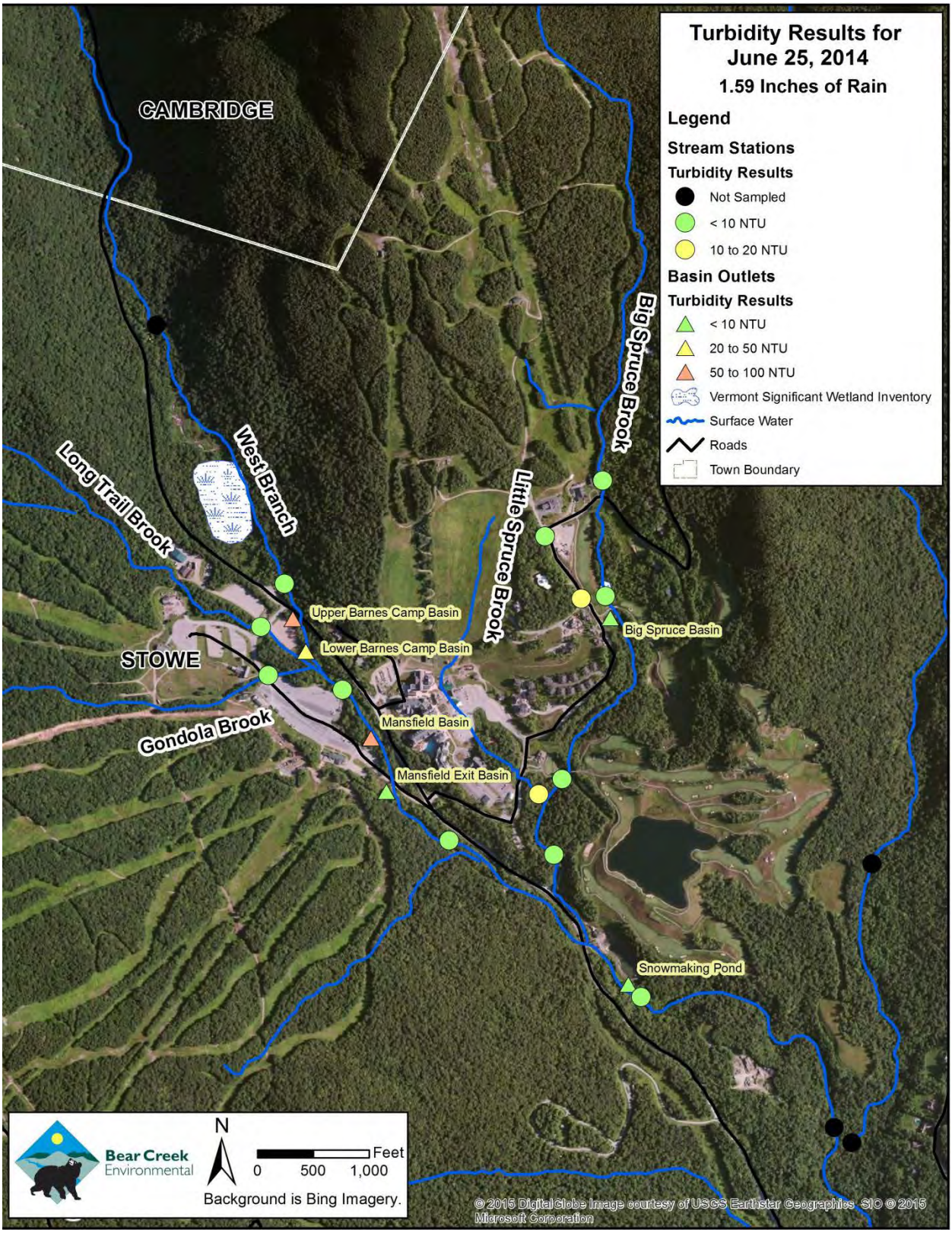

Figure 7. Turbidity Results for June 25, 2014 – 1.59 Inch Rain Event.

October 16, 2014

The second round of event based sampling took place on October 16th between 3:25 PM and 5:10 PM. The resort received 0.88 inches of rain over the course of that morning, as shown in Figure 8. The rain was mostly light during sampling, though picked up in intensity briefly around 4:00 PM.

Accepted data from the USGS indicate that the West Branch of the Little River peaked at 71 cfs just before 2:00 PM on the 16th. Sampling occurred immediately after the peak of the hydrograph (Figure 9).

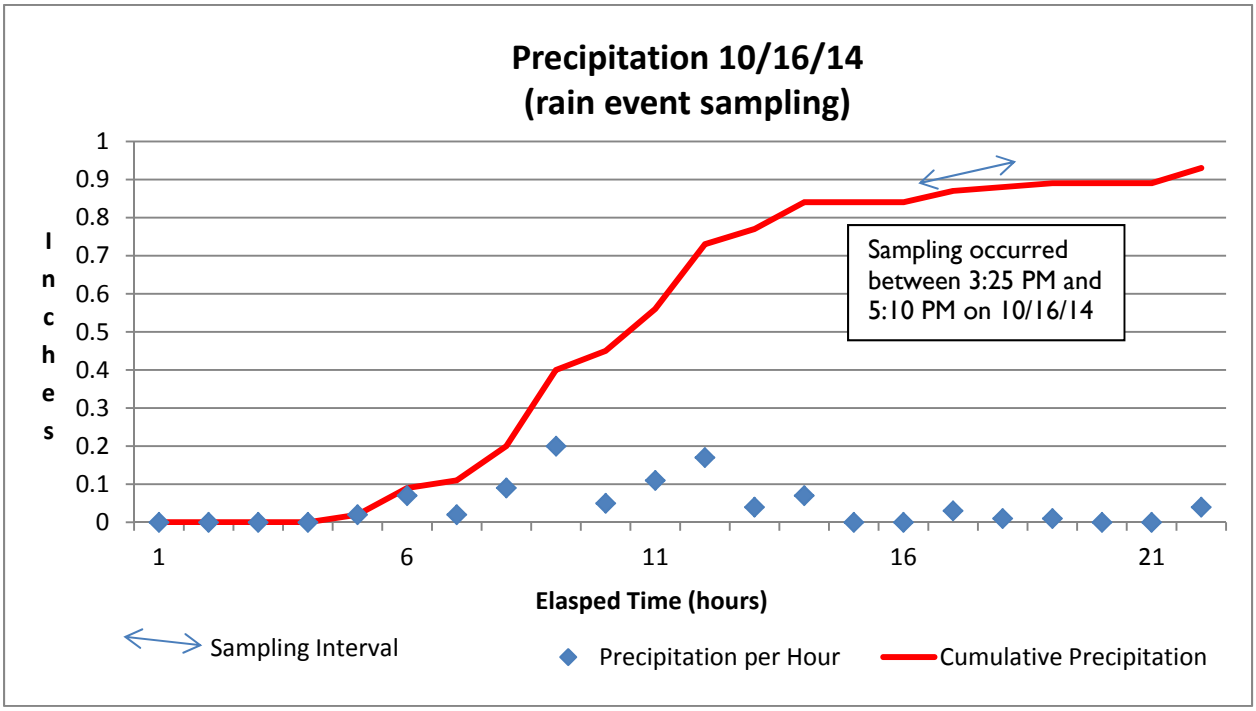

Figure 8. Precipitation at Stowe Mountain Resort on October 16, 2014.

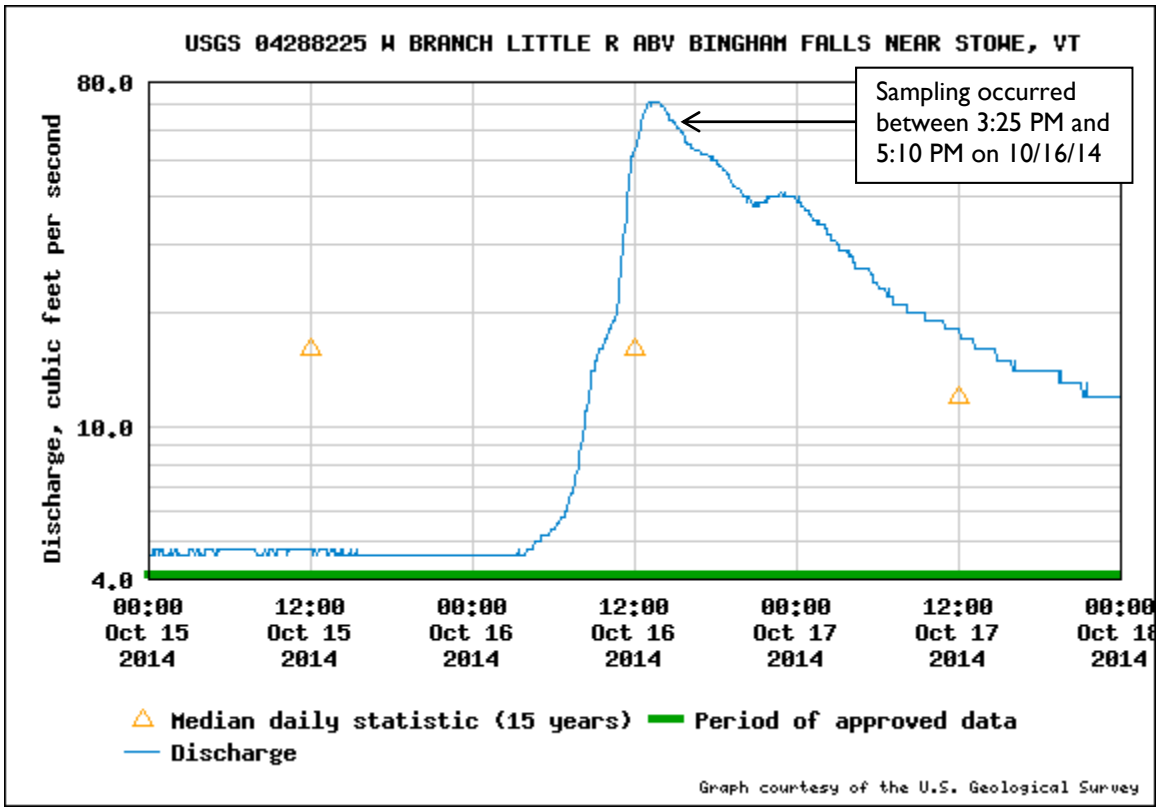

Figure 9. West Branch hydrograph for the October 2014 sampling round.

As shown below in Figure 10, turbidity exceeded Vermont Water Quality Standards at two stations on October 16, 2014. The upstream station on Ski Club Brook had the highest turbidity of any surface water station at 33.4 NTU, followed by Little Spruce Brook at 11 NTU. The lowest turbidities were observed at the uppermost Big Spruce Brook station and the Gondola Brook station (< 1 NTU), the West Branch at Barnes Camp at 1.14 NTU, and the West Branch RM 7.5 at 1.25 NTU. Overall, surface water turbidity values were very low during this event, most of which were under 5 NTU.

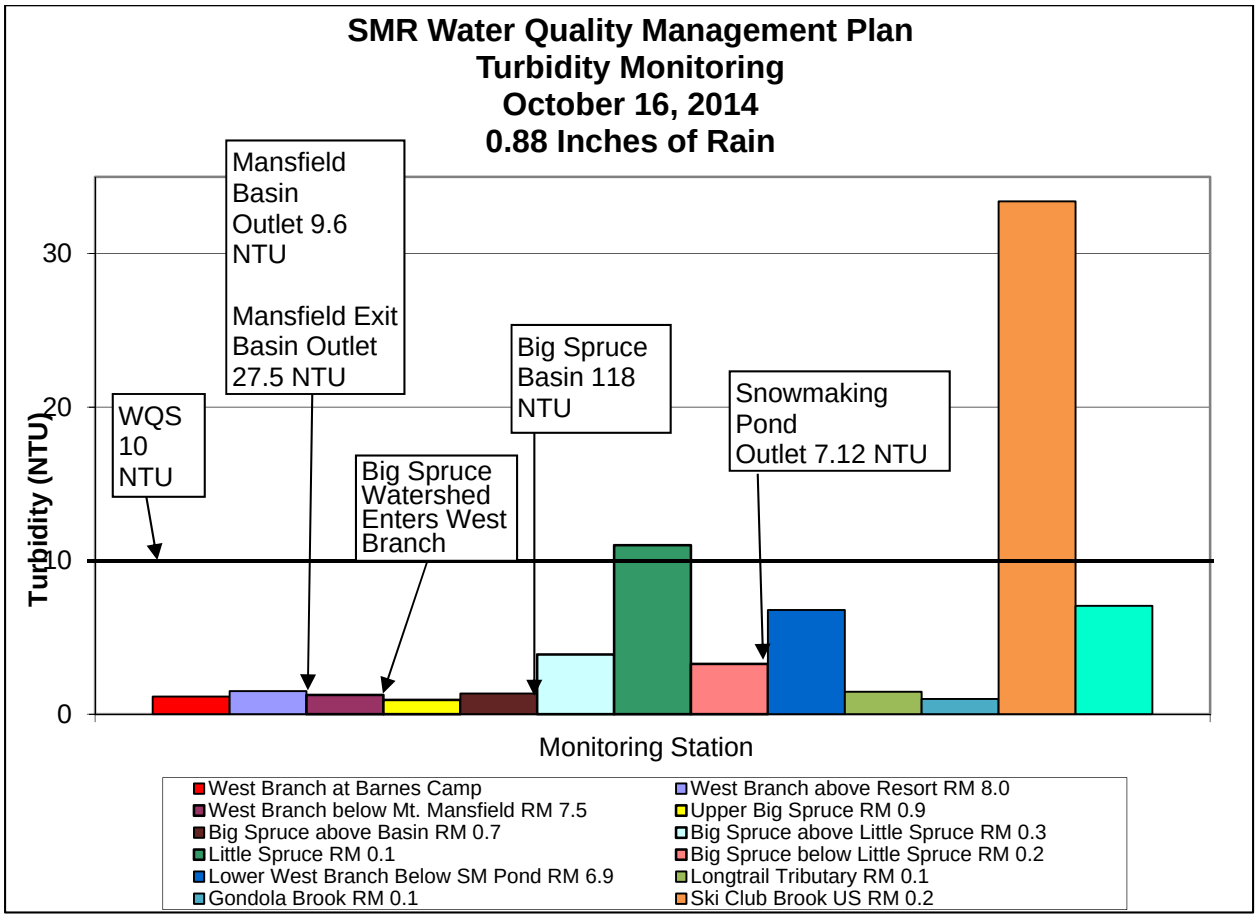

Figure 10. Turbidity results from October 16, 2014.

Turbidity values at the resort's sediment basins varied widely during sampling on October 16, 2014. The highest turbidity was observed at the Big Spruce Basin outlet, measuring 118 NTU, followed by the Mansfield Exit Basin at 27.5 NTU. The lowest turbidities were recorded at the Snowmaking Pond and Mansfield Basin outlets, at 7.12 NTU and 9.6 NTU, respectively. Figure 11 displays turbidity values observed at each surface water and basin station on October 16th.

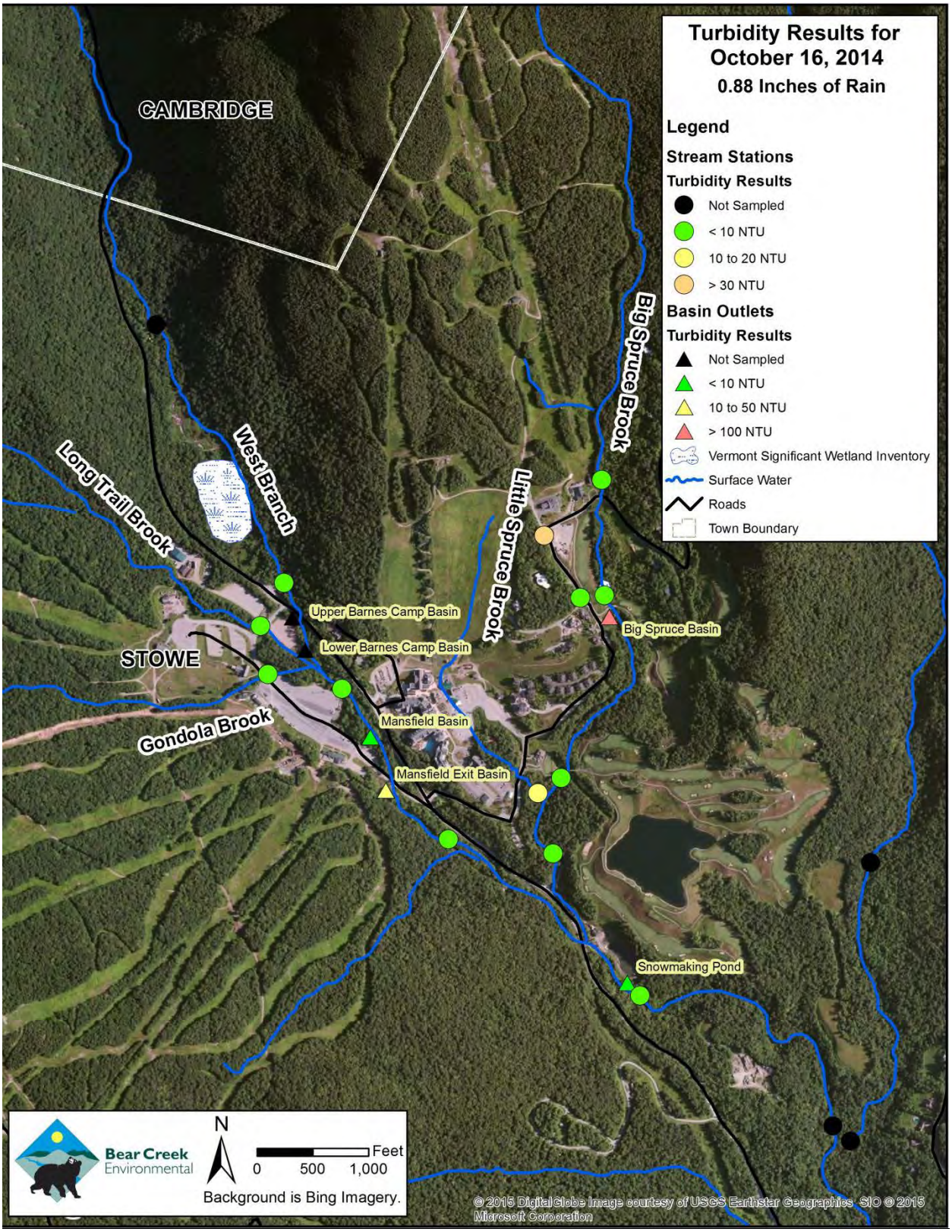

Figure 11. Turbidity results for October 16, 2014 – 0.88 inches of rain.

November 24, 2014

The third round of event based sampling for the 2014-2015 monitoring year occurred on November 24, 2015. Warm temperatures sparked snowmelt at the resort on this date, coupled with light rain that increased runoff. A total of 0.49 inches of rain fell at the resort prior to sampling, and temperatures were in the high forties and low fifties. Figure 12 below shows the pattern of rain throughout this event.

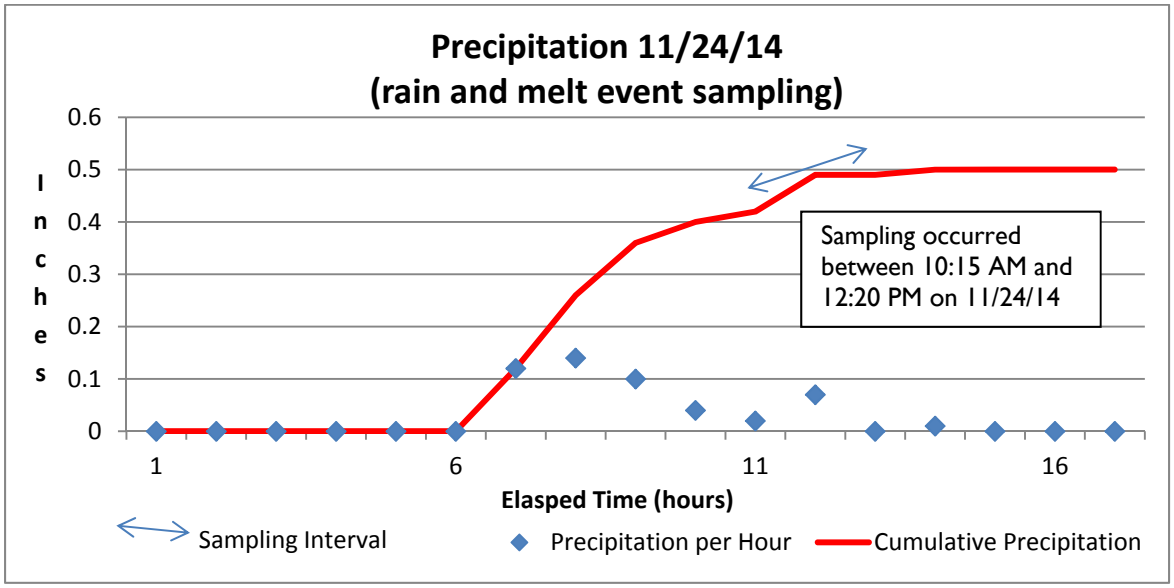

Figure 12. Precipitation data for the November 24, 2014 event.

As shown in Figure 13, flows on the West Branch rose to a peak during sampling, plateaued, and rose again to a higher peak in the middle of the night on the 24th. The West Branch peaked around 81 cfs during sampling. Figures 14 and 15 display the turbidity results from the sampling. The highest stream turbidity was observed at Ski Club Brook downstream (64.3 NTU), followed by Ski Club Brook upstream at 28.8 NTU, and Little Spruce Brook at 19.9 NTU. In-channel erosion and widening of Ski Club Brook appears to be contributing sediment to the stream during high flow events. Six of thirteen stream stations sampled on November 24th exceeded the Vermont Water Quality Standard of 10 NTU. The upper West Branch, Gondola Brook, and Long Trail Brook had the lowest turbidities for this sampling round. The Mansfield Exit Basin outlet had the highest basin turbidity at 288 NTU, followed closely by the Mansfield Basin direct outlet at 279 NTU. The Big Spruce Basin also had an elevated turbidity of 104 NTU.

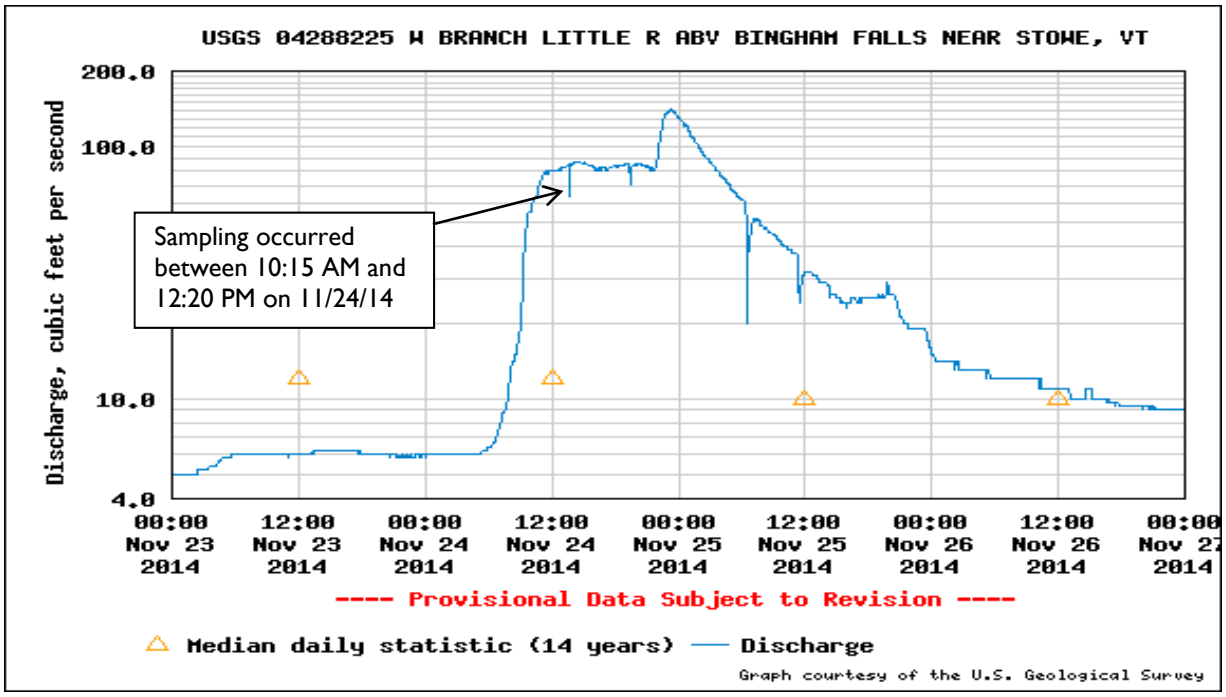

Figure 13. Hydrograph for the West Branch for the 11/24/14 rain and snowmelt event.

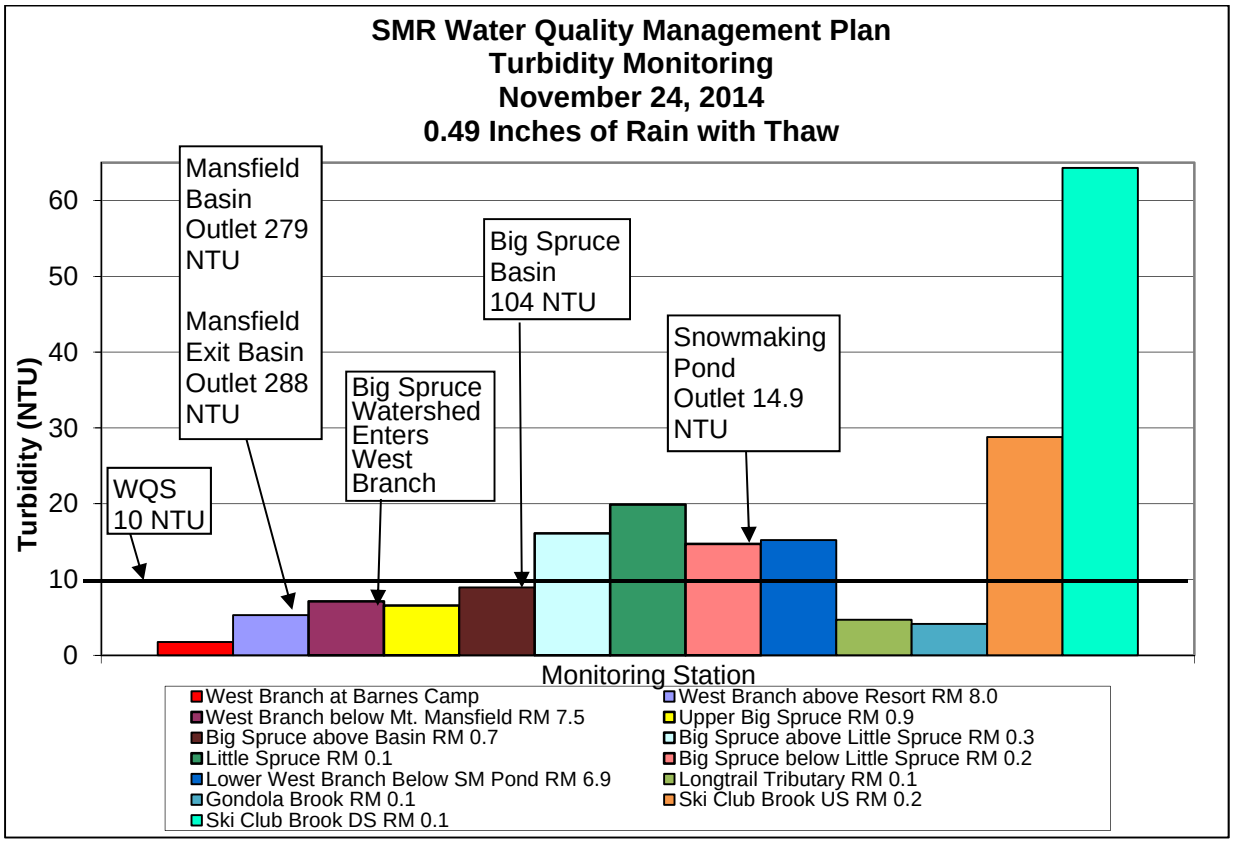

Figure 14. Turbidity results for November 24, 2014 sampling round.

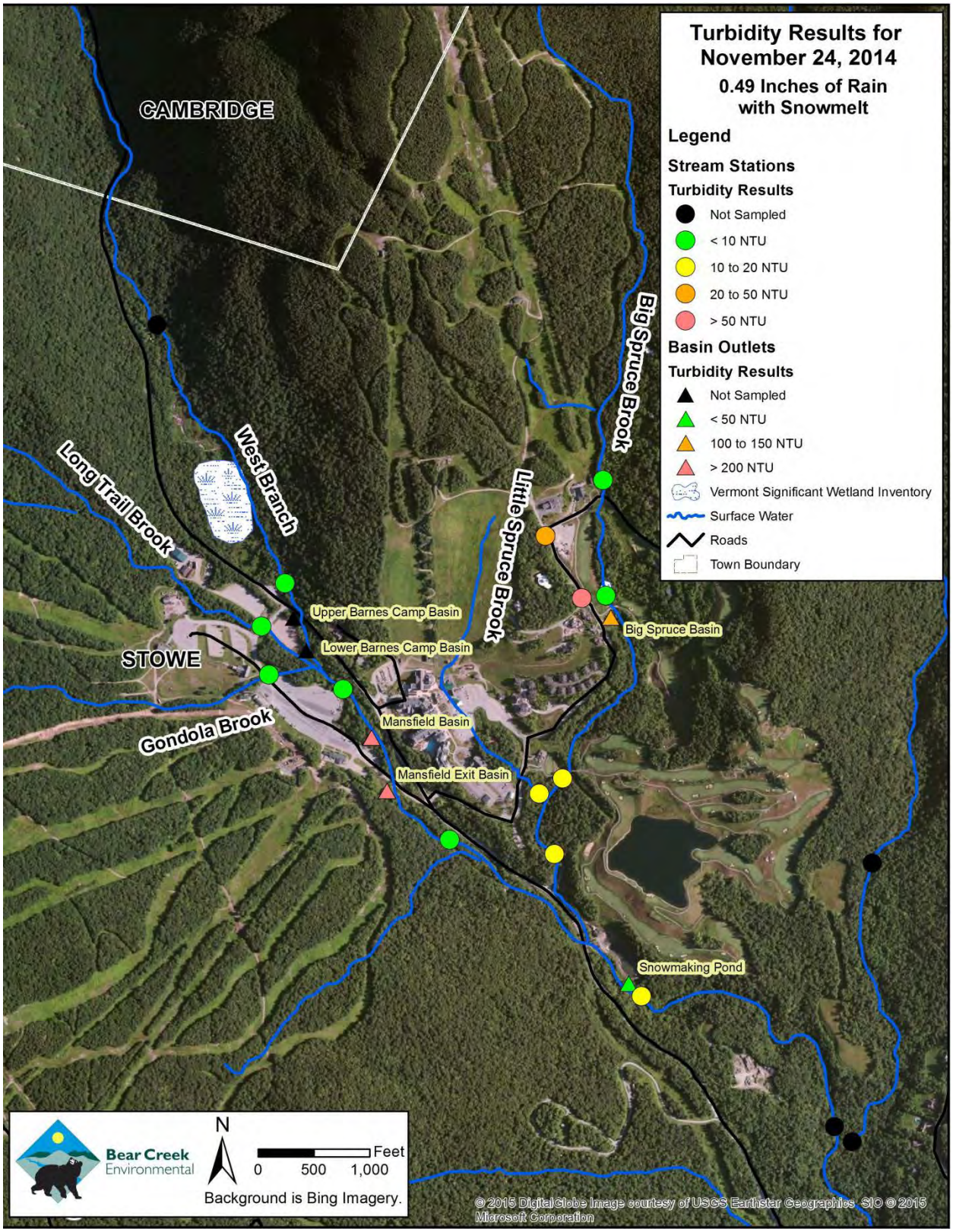

Figure 15. Map of turbidity results for November 24, 2014.

April 16-21, 2015

Warm temperatures throughout April 2015 caused continuous snowmelt at Stowe and elevated stream flows. A partial sampling round occurred on April 16, 2015 when temperatures in the 60s caused increased runoff and a peak on the West Branch of the Little River. Seven samples were collected due to the sun setting during sampling. Things looked very good at the resort that evening and all turbidity results were low.

On April 17, 2015, 0.48 inches of rain coupled with warm temperatures caused flows to rise even more on the West Branch. A full sampling round occurred on this date. Figure 16 below shows the pattern of rainfall on April 17th. Figure 17 shows the hydrograph for the West Branch during sampling on the 16th and the 17th.

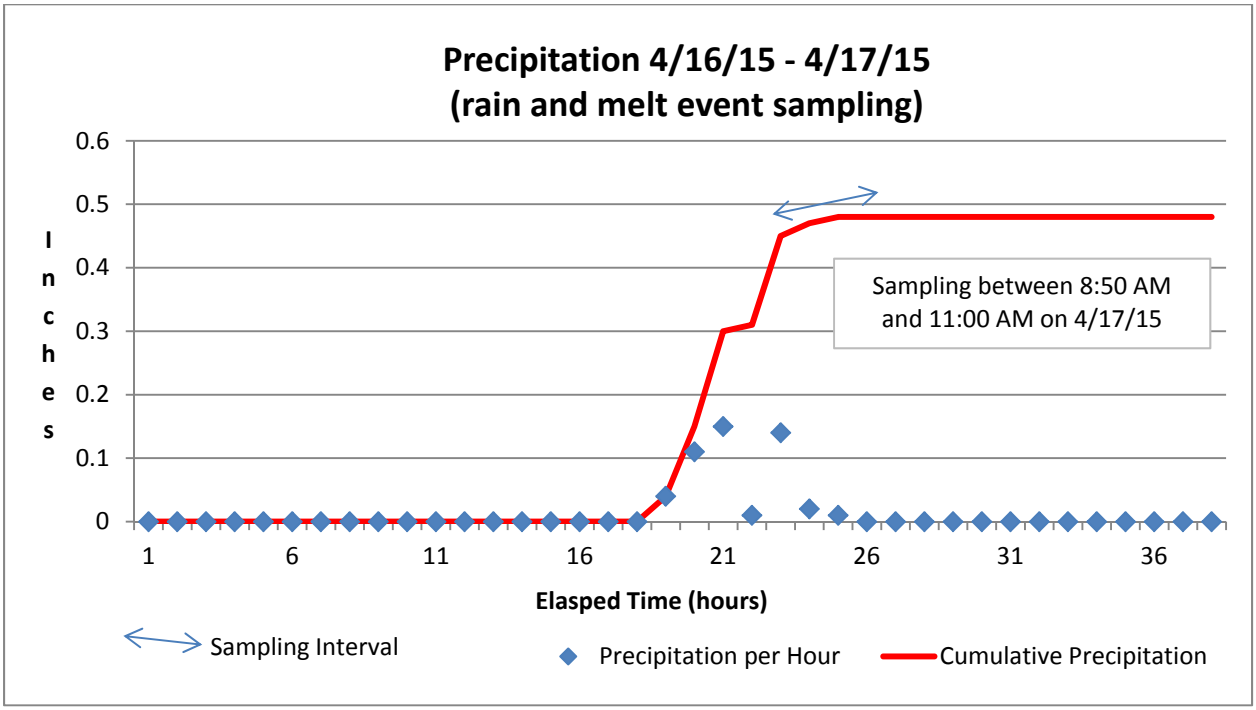

Figure 16. Precipitation data for April 16 and 17, 2015.

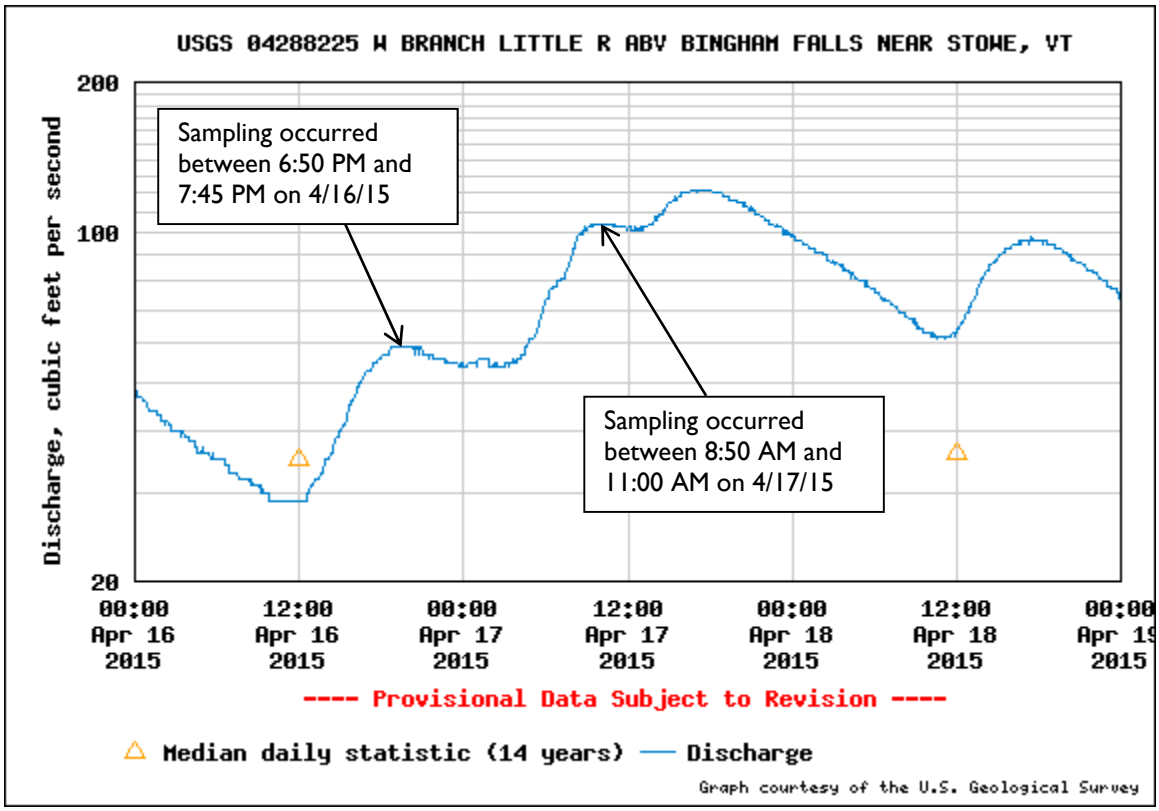

Figure 17. Hydrograph of the West Branch for April 16 through 18, 2015.

Turbidity results for April 17, 2015 were overall very good. Only three surface water stations exceeded the Vermont WQS, and not by much. The highest stream turbidity was observed on Ski Club Brook at the downstream station (20.8 NTU), followed by Big Spruce at RM 0.2 with 15.9 NTU, and Little Spruce Brook at 12.6 NTU. The stations with the lowest turbidities were all of the West Branch stations and the upper Big Spruce stations.

The Big Spruce Basin and Snowmaking Pond had low turbidities (24.7 and 0.33 NTU, respectively), but the Mansfield Basin and Mansfield Exit Basin had high turbidities (436 and 233 NTU, respectively). The high basin turbidities are likely related to sediment laden snow piles adjacent to parking lots melting and overloading the basins. Following snow melt, the Resort removes this sediment from the parking lot in the spring as part of the erosion prevention and sediment control program. Turbidity results for the April 17, 2015 sampling are displayed in Figures 18 and 19.

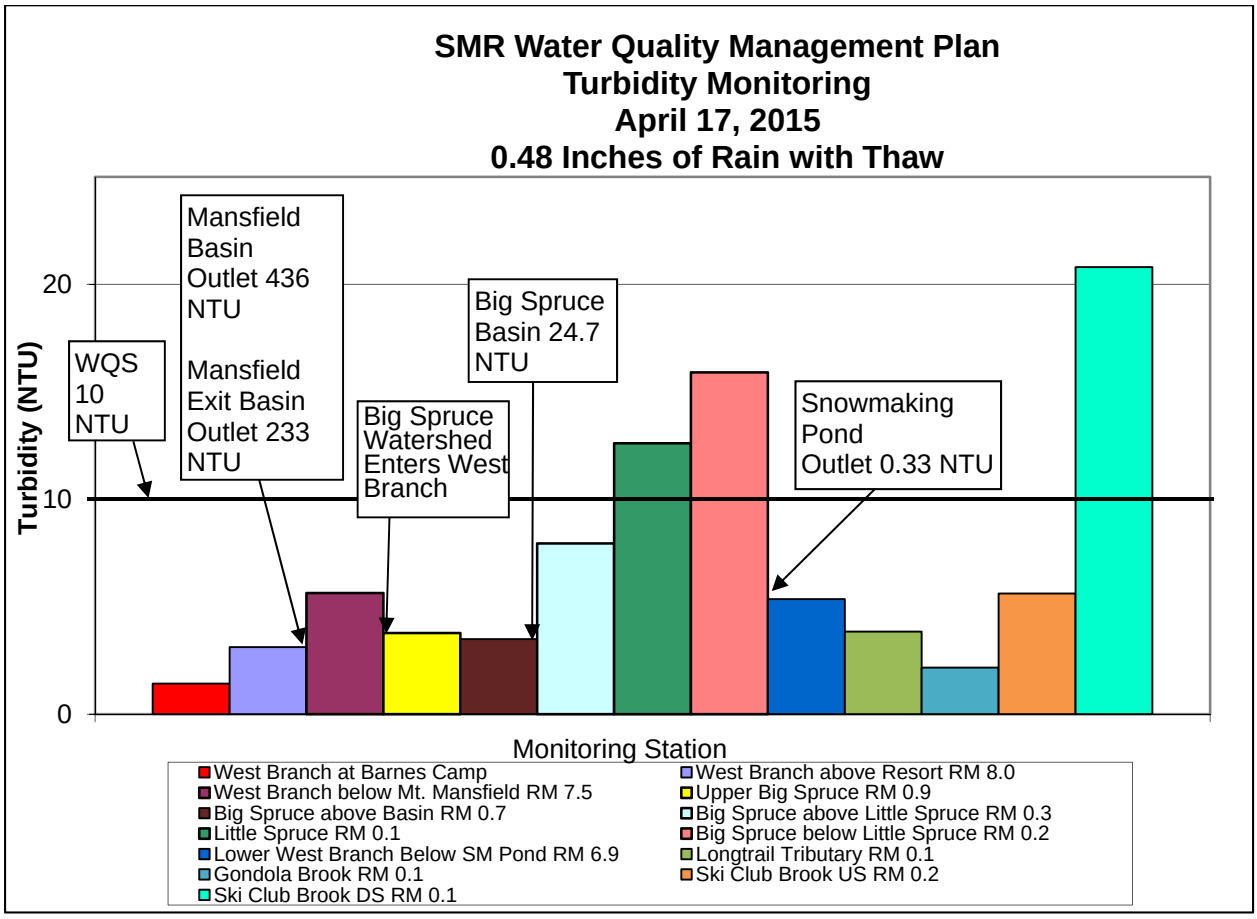

Figure 18. Turbidity results for sampling conducted on April 17, 2015.

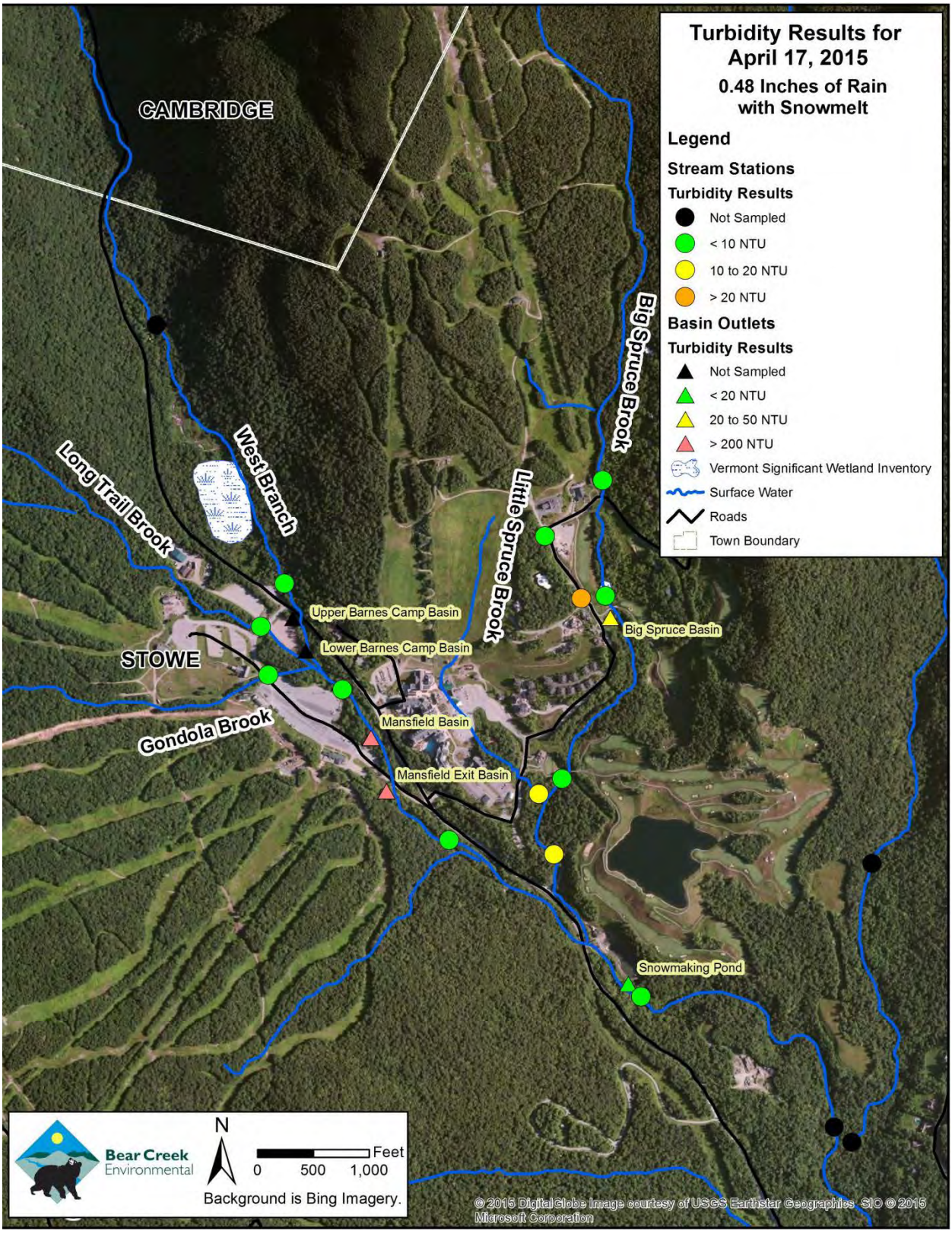

Figure 19. Map of turbidity results for sampling round on April 17, 2015.

On April 21, 2015, another 0.48 inches of rain fell at Stowe Mountain Resort. Coupled with warm temperatures, this again caused snowmelt and increased runoff. The West Branch peaked at 167 cfs just before sampling occurred (Figure 20). A partial sampling round occurred that evening to characterize runoff in the vicinity of the resort. Turbidities were very low at all stream stations, except for Little Spruce Brook which had slightly elevated turbidity. The Mansfield Basin outlet had extremely high turbidity, which can likely be attributed to sediment from snow piles that melted in the Mansfield parking lot.

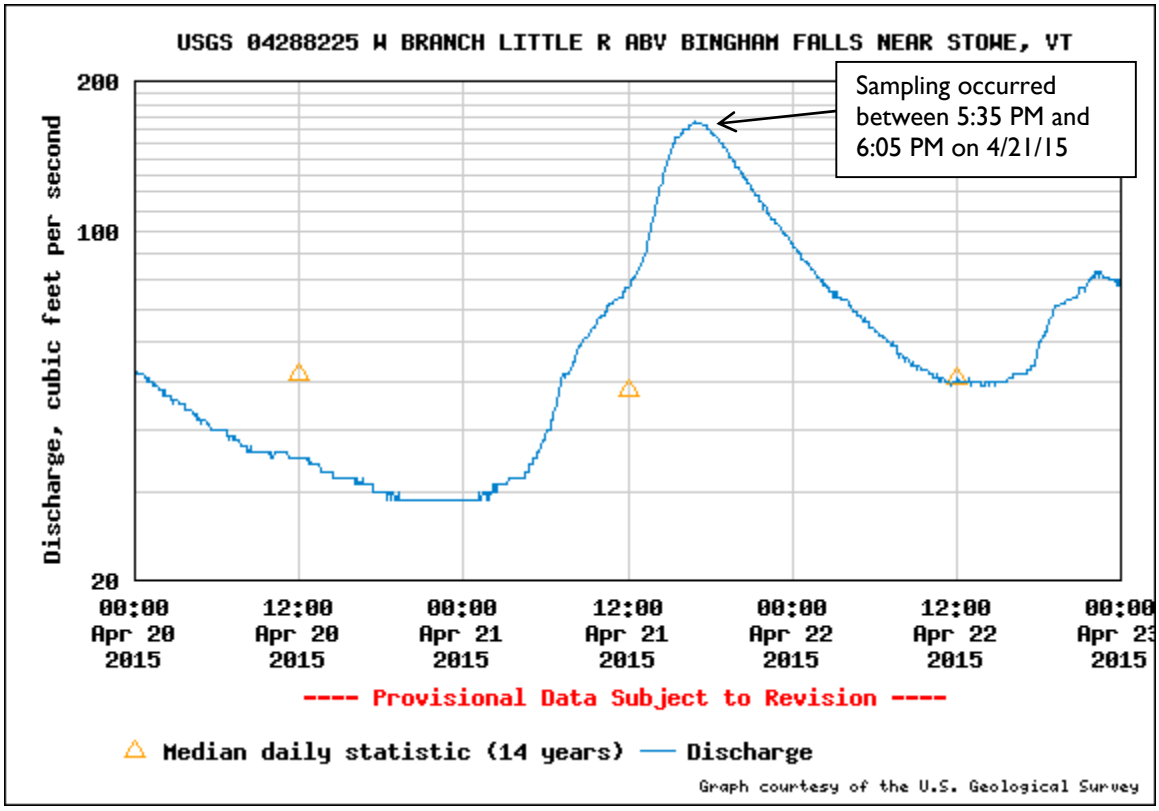

Figure 20. Hydrograph of the West Branch for April 21, 2015.

The event-based chemistry results for 2000 to 2014 are summarized in Appendix 1. A mean value, maximum value, and the sample size are presented for the construction monitoring that has occurred between fall 2003 and spring 2015.

pH

The following mean pH values were reported for the period (2003-2015):

- WB8.2 (West Branch above Barnes Camp, 2010-2015) – 6.44 s.u.
- WB8.0 (West Branch below Barnes Camp, 2006-2015) – 5.76 s.u.
- WB7.5 (West Branch above Big Spruce Brook) – 6.47 s.u.
- WB6.5 (Lower West Branch) – 6.23 s.u.
- BS0.9 (Upper Big Spruce) – 5.02 s.u.
- BS0.7 (Big Spruce above basin, 2009-2015) – 6.01 s.u.
- BS0.3 (Big Spruce above Little Spruce, 2006-2015) – 6.19 s.u.
- BS0.2 (Lower Big Spruce) – 6.31 s.u.
- LS0.1 (Little Spruce Brook) – 6.44 s.u.
- SC0.2 (Upper Ski Club Brook, 2010-2015) – 6.12 s.u.
- SC0.1 (Lower Ski Club Book, 2010-2015) – 6.16 s.u.
- LT0.1 (Lower Long Trail Brook, 2012-2015) – 5.26 s.u.
- GB0.1 (Lower Gondola Brook, 2012-2015) – 5.39 s.u.

Event-based sampling reveals that streams in the vicinity of Stowe Mountain Resort are critically acidified. In particular, the high elevation streams and undeveloped watersheds appeared to be severely acid stressed. The West Branch below Barnes Camp, Upper Big Spruce Brook, Long Trail Brook and Gondola Brook have mean pH values of less than 6.0 s.u.

Conductivity

In general, conductivity levels were highest on Little Spruce Brook and lowest on upper West Branch, Long Trail Brook, and Gondola Brook. The mean conductivity for the period of fall 2003 through spring 2015 for each of the monitoring stations is provided below in Figure 21.

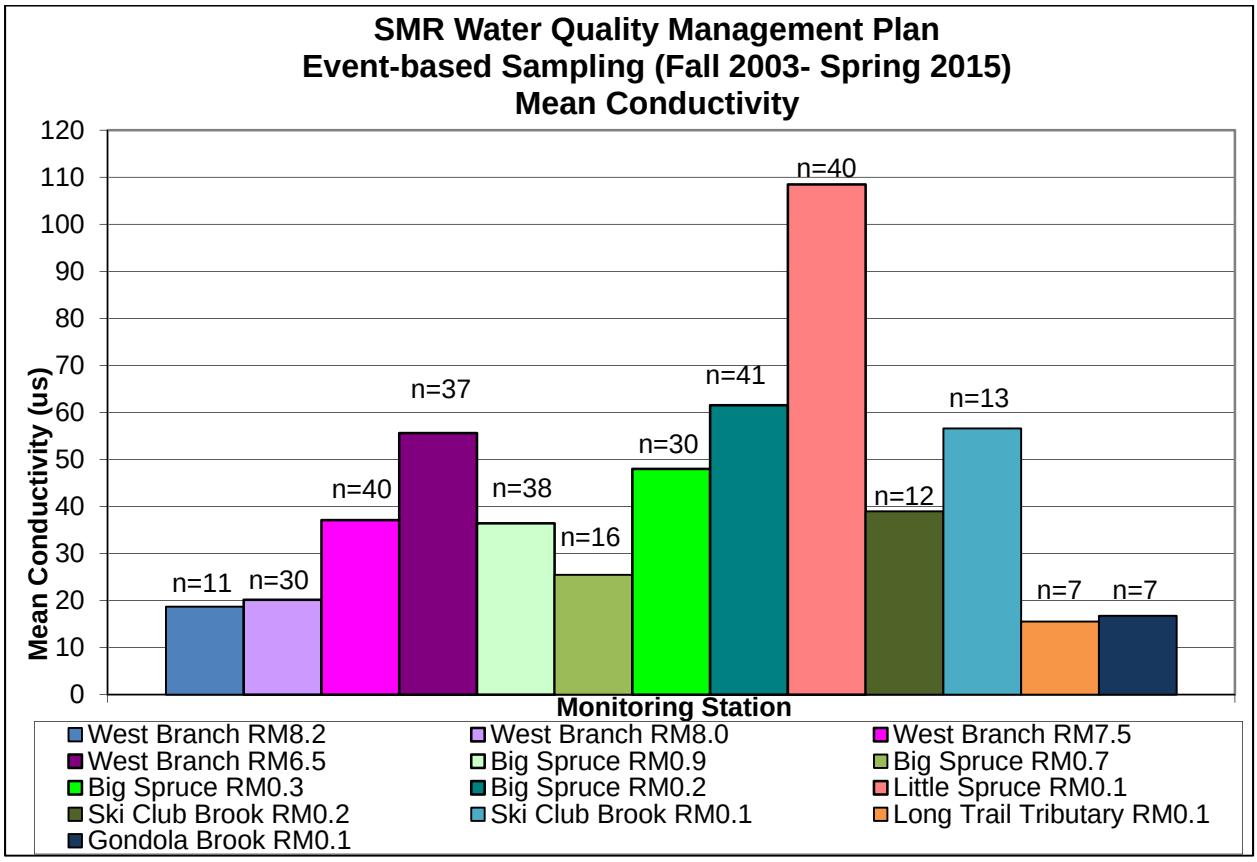

Figure 21. Mean conductivity reported for event-based sampling for fall 2003 through spring 2015.

6.0 EPSC PROGRAM AND MONITORING

Event based monitoring is used by the Resort to sample turbidity and target areas for improvement. As discussed in Section 5.2, BCE sampled four precipitation/snow melt events during the spring 2014 to spring 2015 monitoring period. BCE sampled on June 25, 2014; October 16, 2014; November 24, 2014; April 16, 2015; April 17, 2015; and April 21, 2015. The April 16 and 21, 2015 were minor events and only a few samples were collected at the downstream monitoring stations to document the low turbidity conditions. For this reason, the turbidity results for April 16 and 21, 2015 are not included in the turbidity summary results (Table 6) for the monitoring period. The final column of Table 6 shows the station's average turbidity for the monitoring period. In general, turbidity levels were low during the June 25, October 16, and April 17 events and moderate during the November 24 event.

West Branch Subwatershed

West Branch

Throughout the 2014-2015 monitoring year at Stowe Mountain Resort, turbidity results from sampling on the West Branch were very low. Only at one station (WB 6.9) during one sampling round (Nov 24) did turbidity exceed the Vermont Water Quality Standard of 10 NTU. Gondola Brook and Long Trail Brook had consistently very low turbidity during sampling from spring 2014 to spring 2015. Stations on the West Branch at RM 8.0 and 7.5 are in very close proximity to the Mansfield parking area and its stormwater basin outlets. Turbidity values measured during the 2014-2015 events were consistently very low at these two stations. This suggests that resort runoff is being well managed in this area.

The sediment basins in the West Branch subwatershed at Stowe had variable turbidity during the 2014-2015 sampling year. The Mansfield Basin and Mansfield Exit Basin had elevated turbidities during the November and April events, which could possibly be attributed to snowmelt that occurred preceding and during those events. Samples taken at the outlet of the snowmaking pond had consistently low turbidities during sampling in 2014 and 2015.

Big Spruce Subwatershed

Big Spruce Brook

The turbidity values at the Big Spruce upper stations (RM 0.9 and RM 0.7) were typically low. The water quality trends for the downstream stations (RM0.3 and RM 0.2) suggest that turbidity increases slightly between the upstream and downstream stations. The highest turbidity values observed on Big Spruce during the 2014-2015 monitoring period were only slightly higher than the Vermont WQS.

Little Spruce Brook

Construction activities occurred throughout 2014 and 2015 at Spruce Peak within the Little Spruce Brook drainage. Turbidity values observed during event based sampling in 2014 and 2015 were typically higher than the other surface water quality monitoring stations and ranged

between 11 and 20 NTU on sampling dates. These slightly elevated turbidity values may be linked to construction activities at Spruce Peak.

Ski Club Brook

Elevated turbidity values were observed on Ski Club Brook, which is located on privately owned property, on all sampling dates during the 2014 to 2015 monitoring year. The source of this turbidity is not certain, but may be attributable to channel and bank erosion within the brook. Both the elevated turbidity in Ski Club Brook (which flows directly into the Big Spruce Basin) and the swale along Big Spruce Road contribute to sediment that flows into Big Spruce Basin. Stormwater improvements made at the Sensation Lot have helped reduce sediment reaching the Big Spruce Basin.

Table 6. Event-Based Sampling Turbidity Results Spring 2014-Spring 2015 Stowe Mountain Resort

Station	Jun. 25, 2014	Oct. 16, 2014	Nov. 24, 2014	Apr. 17, 2015	Average
WB8.2 (above SMR)	0.95	1.14	1.75	1.42	**1.32**
WB8.0	2.88	1.50	5.31	3.12	**3.20**
WB7.5	2.26	1.25	7.11	5.63	**4.06**
WB6.9	5.57	6.78	15.2	5.35	**8.23**
LT0.1	6.05	1.45	4.70	3.84	**4.01**
GB0.1	1.25	0.99	4.14	2.16	**2.14**
BS0.9	7.37	0.92	6.58	3.77	**4.66**
BS0.7	5.02	1.34	8.96	3.49	**4.70**
BS0.3	6.3	3.88	16.10	7.94	**8.56**
BS0.2	8.64	3.27	14.70	15.9	**10.63**
LS0.1	11.3	11.0	19.90	12.6	**13.70**
SC0.2	8.47	33.4	28.80	5.61	**19.07**
SC0.1	10.8	7.05	64.30	20.80	**25.74**
MT Trib Near Mansfield Basin	NS	9.0	110.0	NS	**59.50**
Trib at Exit Basin	4.5	1.13	6.90	NS	**4.18**
Outlet 1 (Mansfield Basin)	86.5	9.60	279.0	436.0	**202.78**
Outlet 2 (Snowmaking Pond)	5.56	7.12	14.9	0.33	**6.98**

Table 6. Event-Based Sampling Turbidity Results Spring 2014-Spring 2015 Stowe Mountain Resort					
Station	**Jun. 25, 2014**	**Oct. 16, 2014**	**Nov. 24, 2014**	**Apr. 17, 2015**	**Average**
Outlet 3 (Big Spruce Basin)	9.41	118	104.0	24.70	**64.03**
Outlet 4 (Mansfield Exit Basin)	8.79	27.5	288.0	233.0	**139.32**
Outlet 5 (Upper Barnes Camp Basin)	51.3	No discharge	No discharge	No discharge	**51.30**
Outlet 6 (Lower Barnes Camp Basin)	26.2	No discharge	No discharge	No discharge	**26.20**
Precipitation	1.59"	0.88"	0.49" with melt	0.48" with melt	
Streamflow (cfs) at time of sampling	127 to 145	52 to 59	61 to 81	101 to 104	
Stream station turbidity exceeds 10 NTU Sediment basin outflow with elevated turbidity (> 100 NTU) NS – Not Sampled					

Stowe Mountain Resort expanded its program during the 2007 construction season to promote erosion prevention and sediment control across the resort. This program has been continued over the past several years. A report prepared by Stowe Mountain Resort describing the erosion prevention/sediment control (EPSC) improvement projects is provided in Appendix 2. During spring 2014 and 2015, as part of routine maintenance at the resort, accumulated sand from the winter was removed from parking lots, roads, culvert inlets, swales, water bars, stone check dams and sediment basins to prevent sediment reaching surface waters. Stormwater improvements made to the Resort in 2012 in response to the 1272 order issued on May 3, 2012 are summarized in Nealon and Kinghorn (2013). EPSC activities on the Spruce site of the report are reported in the 2014 EPSC Annual Monitoring report, which is included in Appendix 2 of this report.

Highlights for the EPSC are provided below. All disturbed areas were seeded and mulched.

- Re-grading, track packing, ditch cleaning, stone check dam enlarging, and cleaning of sediment basin at the Lower Barnes parking lot;
- Cleaning and re-armoring of conveyances surrounding the Bus Lot at Mansfield
- Cleaning out of sediment from the Mansfield basins;
- Stone added to increase armor at the Mansfield Exit basin; check dams also added at basin;
- Re-grading and waterbar repair on the Duckwalk;
- Berm reinforced at Mansfield Basin and large stone reshaped to better handle large flows;
- Waterbar repair and replacement of three culverts along the Gondola workroad;
- Re-grading and waterbar and conveyance repair on several trails including Tyro, Perry Merrill, Nosedive, Gondolier, East Run, North Slope, West Run, Dalton's, Liftline, Starr, 5th Ave, Hayride, and T-line;
- Waterbar repair, sediment trap restoration, installation of new diversionary conveyances along Crossover road;
- Riprap added to stormwater conveyance for increased stability at Yucca Flats;
- Culvert replacement under Middle National;
- Basins along Spruce Peak Road were cleaned and swales around Sensation Lot reshaped;
- Big Spruce Basin was cleared of sediment;
- Regrading on Catwalk;
- Ditch re-shaping along Sterling Road;
- Cleaning out of the sediment basins at the West Lot; adjacent road was paved to increase stability and reduce sediment loading to basins;
- Culvert extended and repaired under Liftline Crossover, waterbar repair;
- Waterbar repair and ditch work on Lullaby Lane;
- Cleaning out of forebay and diversion basin at the Primary Pumphouse.

7.0 SEDIMENT ASSESSMENT

BCE conducted pebble counts at specified sediment monitoring stations to evaluate channel materials. A substrate summary table of the pebble counts is included in Appendix 3 on page 1. The results of each pebble count are shown on pages 2 through 16 of Appendix 3.

Embeddedness:

Embeddedness was assessed at the seven biomonitoring stations. All stations had embeddedness estimates of 5-25% (very good) in 2014 and met the target goals.

Channel Materials:

The pebble count data serve as an important tool for understanding improvement in habitat from remediation efforts as well as impacts from catastrophic flood events. As shown below in Figure 22, the percentage of particles less than 8 mm met the target threshold of less than or equal to 20 percent of the substrate composition at all monitoring stations in 2014. Both the graph of the percentage of particles less than 8 mm and the percent fines (Figure 23), indicate there was a shift toward smaller particle sizes in 2010. A high flow event in August 2010 was the primary cause and the percentage of fines has generally decreased since 2010 as the sediment works its way through the study area. This shift can be seen for each station on the graphs in Appendix 3.

All the monitoring stations in 2014 also met the target for percent fines. The monitoring stations met all three target goals for sediment in 2014. Streams in the vicinity of SMR will continue to be monitored for changes in channel substrate condition as the MDP continues to be implemented.

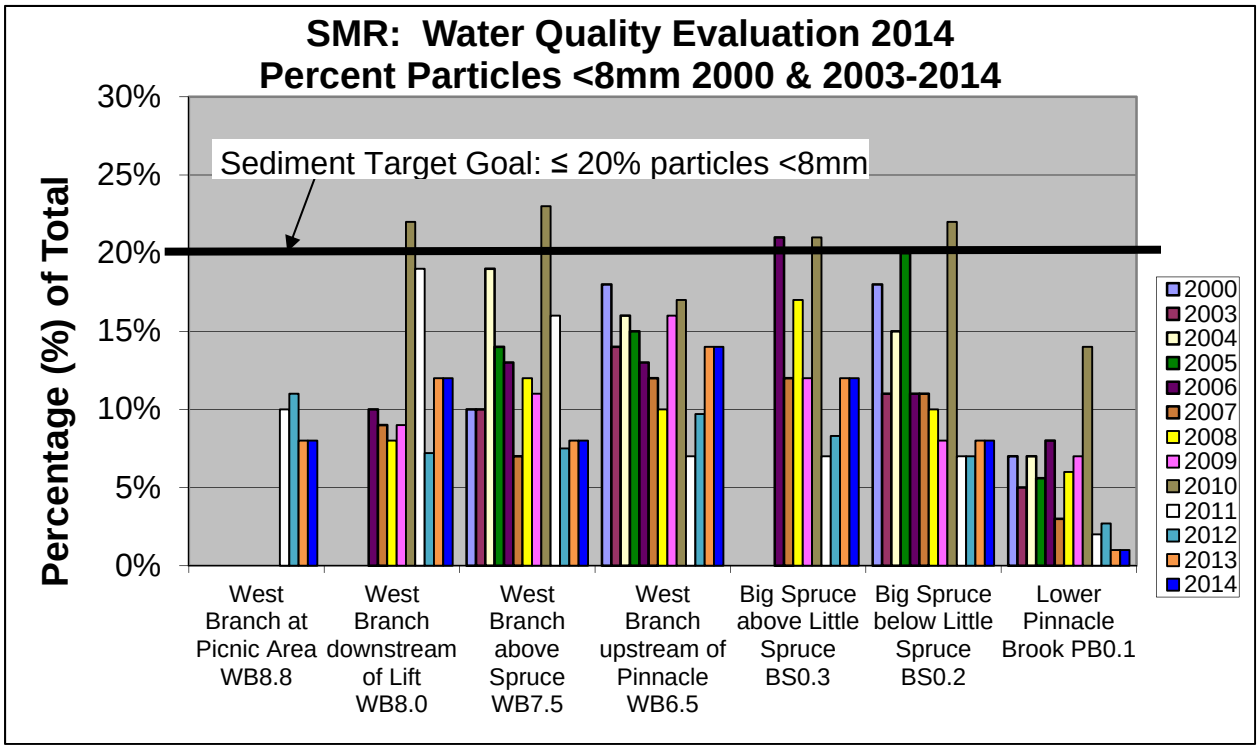

Figure 22. Substrate Assessment – Percent particles less than 8 mm.

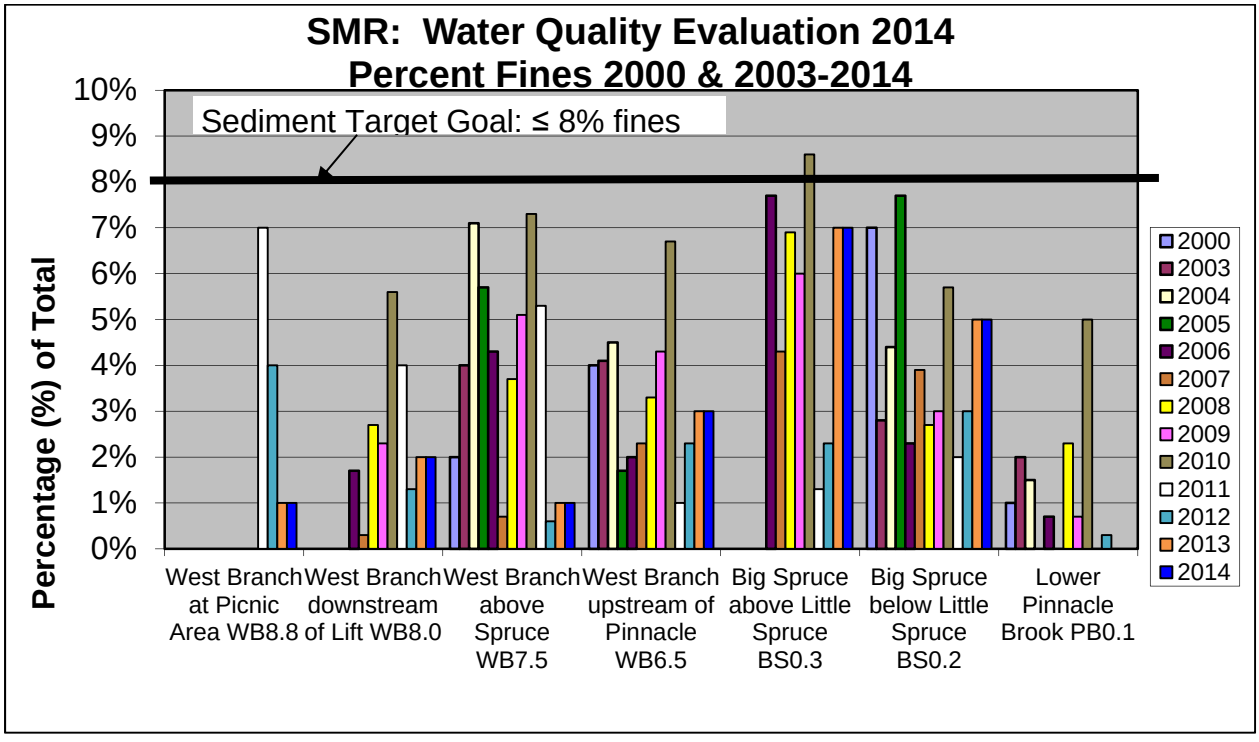

Figure 23. Substrate Assessment – Percent fines.

8.0 IRON ASSESSMENT

During May 2015, a field reconnaissance was conducted on Big Spruce Brook to identify factors potentially impacting aquatic organisms. River scientists walked the brook from above the Spruce Peak Road crossing to its mouth at the West Branch of the Little River, noting prominent channel features and impacts. Overall, channel instability was observed as being minimal, and is likely not a major adverse impact to aquatic organisms.

Observations from the field suggest that water chemistry is having the greatest adverse effect on macrobenthic organisms. Nineteen iron seeps were recorded along Big Spruce during the reconnaissance. Five of these seeps appear to be contributing significant amounts of iron to the brook. Figures 24 and 25 below show photos and the locations of several prominent iron seeps in relation to biomonitoring stations. These seeps do not appear to be related to current construction activities at Spruce Peak, and have likely existed for many years.

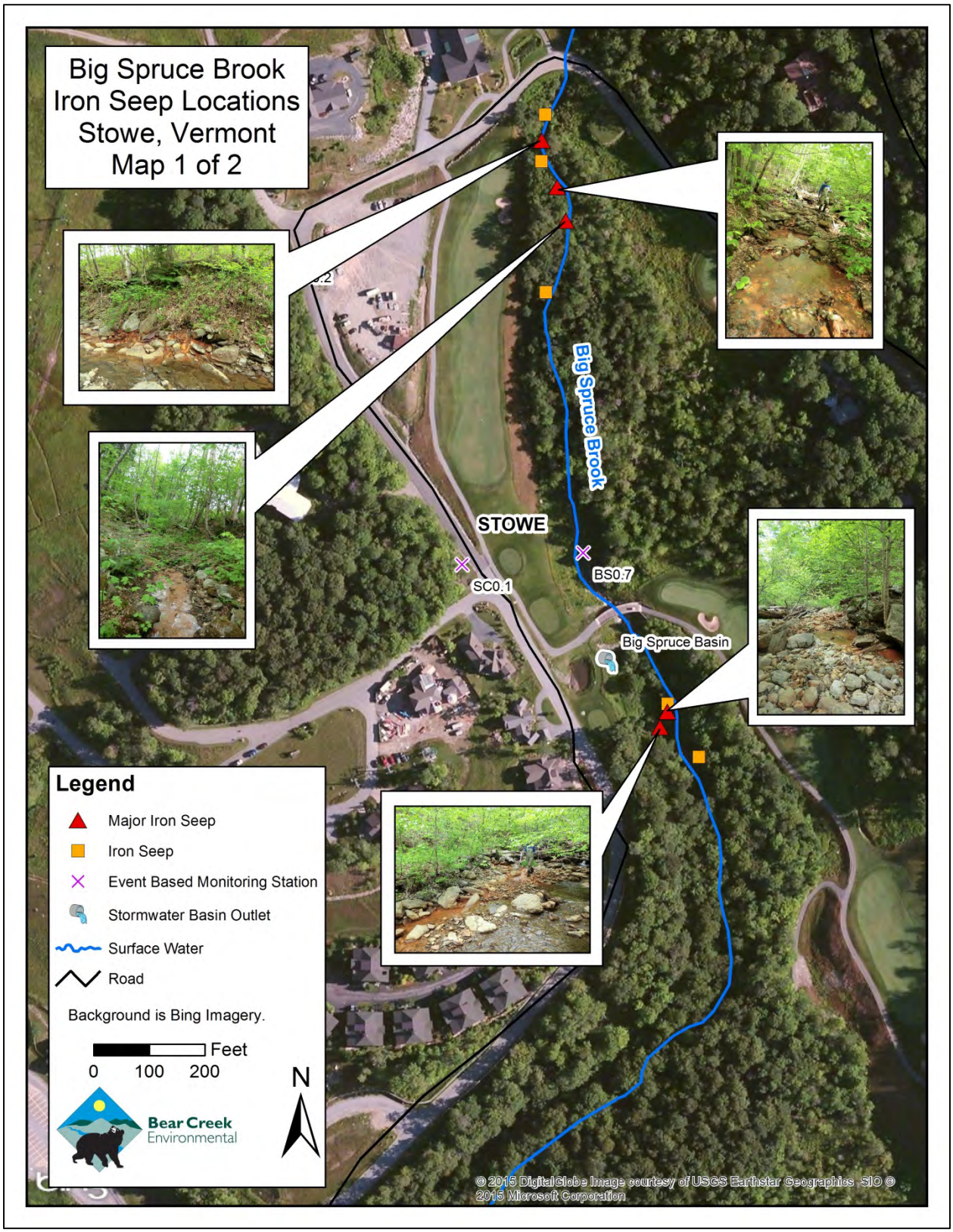

Figure 24. Locations and photos of iron seeps along Big Spruce Brook.

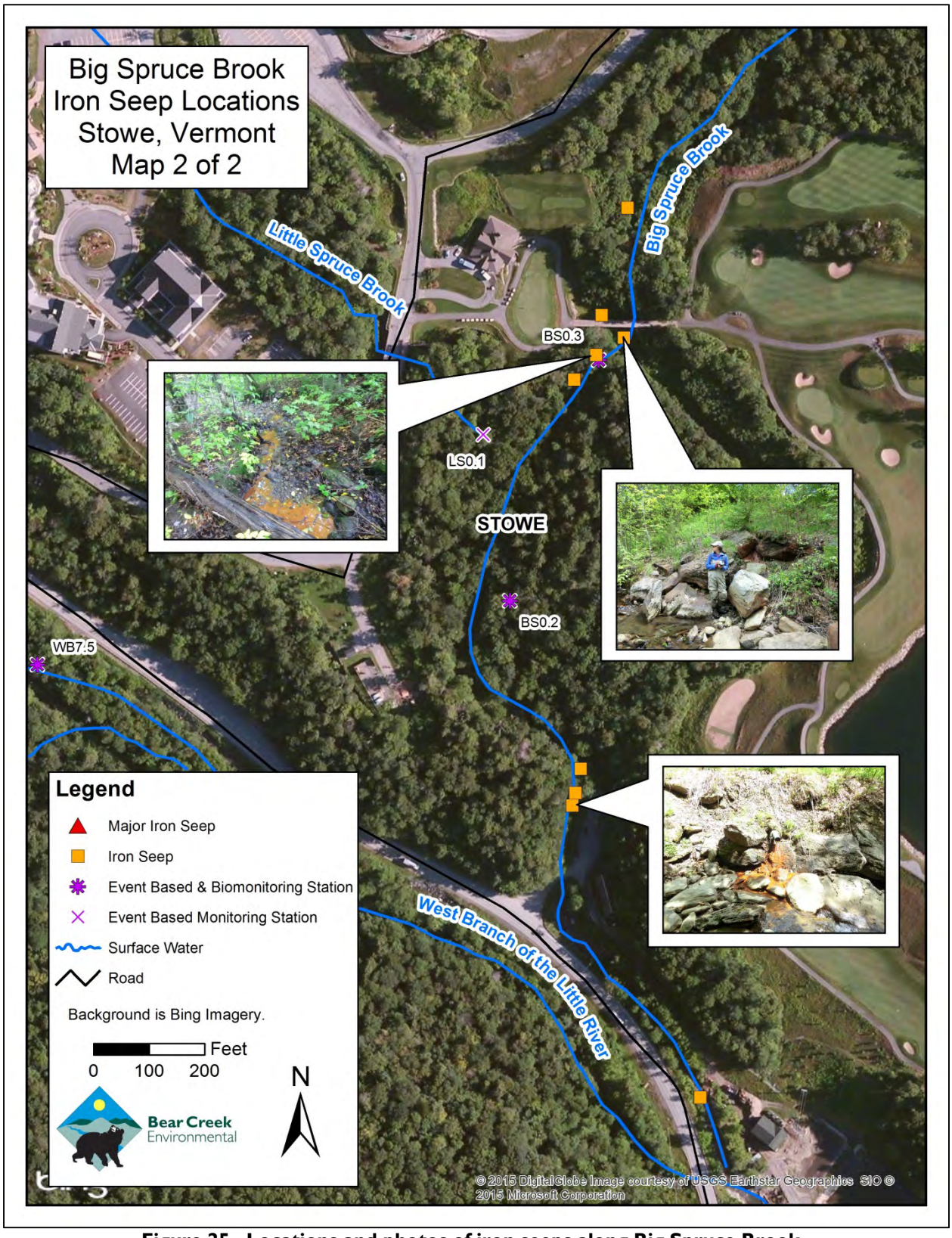

Figure 25. Locations and photos of iron seeps along Big Spruce Brook.

9.0 BIOMONITORING AND HABITAT ASSESSMENT

Macroinvertebrate kick net sampling and habitat assessments were conducted by Catherine Szal on September 22, 2014. Biomonitoring and habitat assessments were conducted on the four West Branch stations, two Big Spruce Brook stations, and one Pinnacle Brook station. The sampling took place under moderate flow conditions. Two replicate kick net samples were collected at each station with the exception of Big Spruce RM 0.3, where habitat is limited. Figure 26 shows the flow conditions in the West Branch for the past five monitoring years. During the 2010 field season, a large flood event occurred in early August, causing major damage at the resort and changes to the channel morphology and extreme scouring of the streambed. A second flood event took place about a week after the kick net samples were collected on September 26, 2010. During 2011, the daily mean stream flow exceeded 250 cfs as a result of Tropical Storm Irene. The 2012, 2013, and 2014 monitoring seasons are characterized as having low to moderate flows.

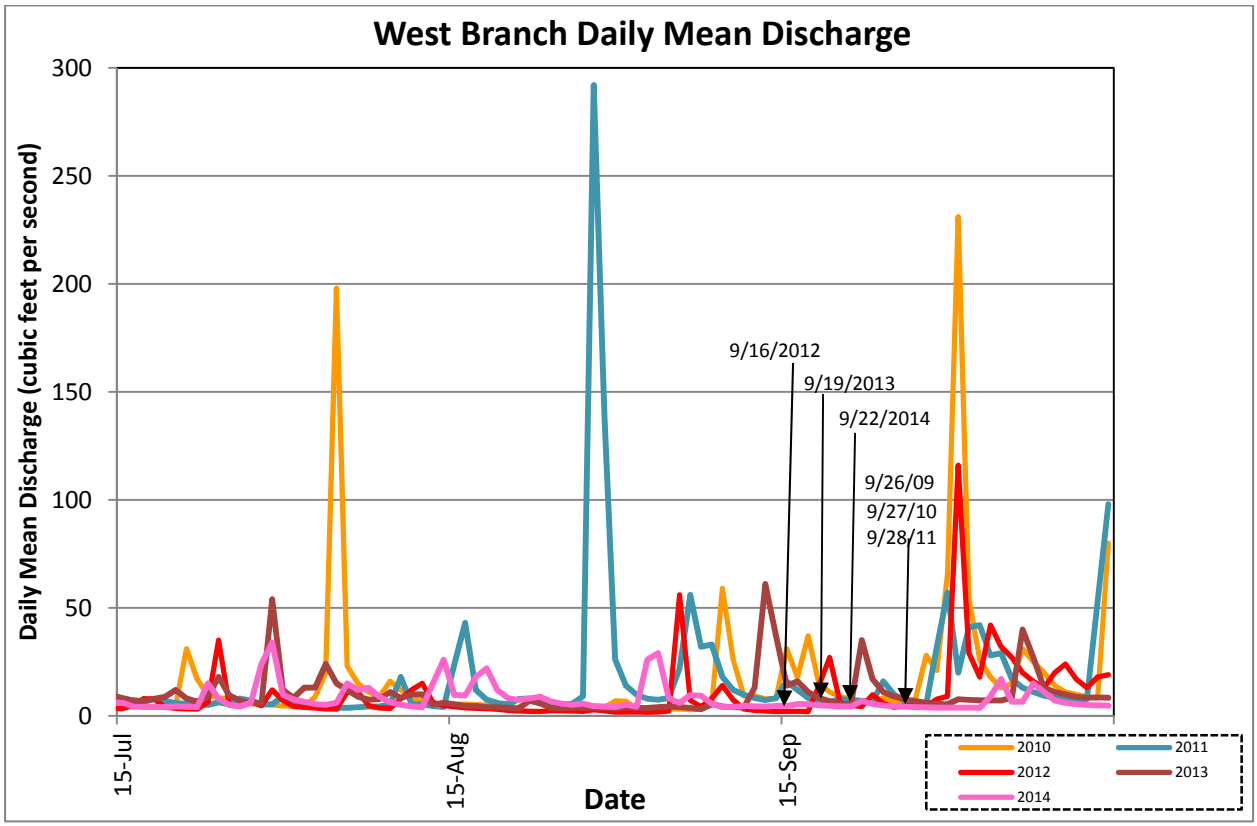

Figure 26. Daily mean discharge on West Branch between mid-July and mid-October for monitoring years 2007 through 2013.

9.1 Habitat Assessment

Qualitative habitat assessments were made at the seven biomonitoring stations on September 22, 2014. Field sheets from these habitat assessments are provided on pages 1 through 15 of Appendix 4. Silt ratings and substrate embeddedness ratings for each station are provided below in Table 7. The silt is rated from 0 to 5 by the biologist. A rating of 0 indicates silt is absent, while a rating of 5 reflects considerable silt as evidenced by a chocolate brown color. Silt can impair aquatic insects by clogging gills. Both Embeddedness ratings were estimated to the nearest quartile by the biologist collecting the kick net samples. Bear Creek scientists also calculated the percent embeddedness by measuring the percentage of substrate covered by fine sediment for ten random cobbles. Embeddedness is an important habitat parameters as it provides a qualitative measure of the interstitial spaces available for colonization by aquatic insects.

Table 7. Substrate Embeddedness and Silt Ratings

Stream	RM	Silt Rating (0-5)	Pebble Count Embeddedness (Percentage)	Biomonitoring Embeddedness (Percentage)
West Branch	8.8	1	14	5-25
	8.0	2	13.5	5-25
	7.5	2-3	21	5-25
	6.5	2	13	5-25
Big Spruce Brook	0.3	4	17.5	5-25
	0.2	3-4	25.5	5-25
Pinnacle Brook	0.1	1	5.5	5-25
Silt rating (0 – none; 5- chocolate)				

<u>West Branch of Little River – RM 8.8</u>:

West Branch RM 8.8 has a surrounding land use of forest and is located off the Notch Road about a half miles upstream of Barnes Camp. There was light sand noted along the margins

of West Branch RM8.8 station. Riffle embeddedness was estimated to be within the range of 5-25% and the silt rating was "1", suggesting good habitat for macroinvertebrates. Diatom coverage on the gravel dominated substrate was estimated to be 80 percent. Stream bank stability was very good as shown in Figure 27.

West Branch of Little River – RM 8.0:

West Branch RM 8.0 is located downstream of the transfer lift crossing. Strong iron seeps were present along the stream margins. Sandy and silt patches in the substrate were noted with embeddedness ranging from 5-25 percent. Bank stability was very good (Figure 28). Canopy cover was estimated to be partly open, creating a cover of about 50 percent. The diatom cover was 90 percent.

Figure 27. West Branch RM 8.8 in picnic area off of Route 108 (9/22/2014).

Figure 28. West Branch RM 8.0 (9/22/14).

West Branch of Little River RM 7.5:

West Branch RM 7.5 is located downstream of the exit to the Mansfield parking low, below the outlets of both the Mansfield Basin and the Mansfield Exit Basin. Diatoms were the dominant periphytic cover. Embeddedness was estimated to be 5-25%, and light iron staining was noted. Bank stability was rated as fair with mass failures within the vicinity of the station. The leaves were mainly on providing a canopy cover of 90 percent, as shown in Figure 29.

West Branch of Little River (RM 6.5):

The lowest station on the West Branch is at RM 6.5, and is located immediately upstream of the confluence with Pinnacle Brook. Bank stability in 2014 was rated as very good at WB 6.5, and substrate embeddedness was rated as 5-25 percent. The diatom coverage was approximately 90 percent. Canopy cover was partly open and was estimated to be 60 percent, as shown in Figure 30.

Big Spruce RM 0.3:

This upper biomonitoring station on Big Spruce Brook at river mile 0.3 is located downstream of the Golf Cottage and upstream of the confluence with Little Spruce Brook. Big Spruce station RM0.3 has historically had several iron seeps. One major iron seep was remediated in fall 2010 using limestone to intercept and treat the groundwater. Several iron seeps were noted on the west bank at the time of the 2014 monitoring with iron precipitate visible in the channel (Figure 31). The station was 5-25 percent embedded and had a silt rating of 4. Bank stability was rated as good and canopy cover was 80 percent at the time of sampling.

Big Spruce - RM0.2:

Big Spruce RM 0.2 is located downstream of the Little Spruce Brook confluence. Bank stability at RM0.2 was rated as fair in September 2014. Significant bank erosion occurred during the August 4, 2010 flood event, and the channel and banks are still undergoing an adjustment process in response to this large flood event. Embeddedness in 2014 was rated as 5-25 percent (very good), although the silt rating was high (3 to 4). A silt layer was noted on some of the cobbles. Percent canopy cover averaged 70 percent. Figure 32 shows an upstream view of the station.

Figure 29. West Branch RM7.5 (9/22/2014).

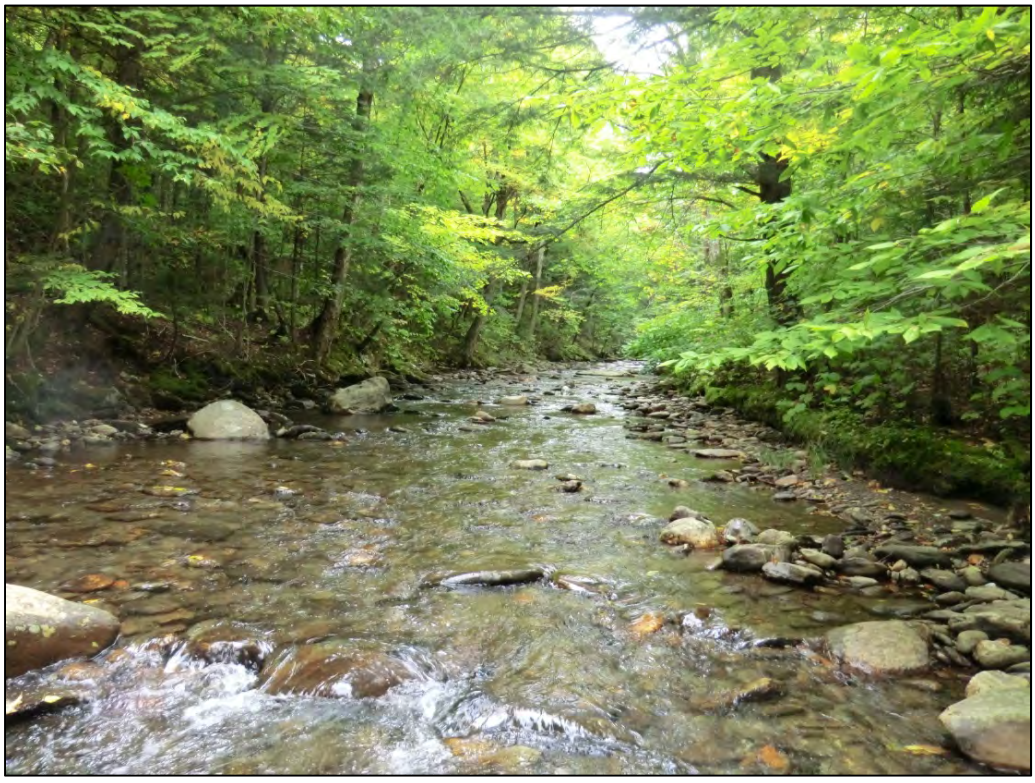

Figure 30. West Branch RM 6.5 above the confluence with Pinnacle Brook (9/22/14).

Figure 31. Big Spruce Brook RM 0.3 (9/22/14).

Figure 32. Looking upstream at Big Spruce RM0.2 (9/22/14).

Pinnacle Brook – RM0.1:

The reference/control station for biomonitoring is located at the mouth of Pinnacle Brook. In 2014, bank stability was rated as very good. Based on habitat observations, the silt rating was low and embeddedness was very good (5 to 25 percent). Canopy cover was approximately 70 percent. There was 80% diatom cover and a 10% cover of blue-green algae. Figure 33 shows the Pinnacle Brook monitoring station.

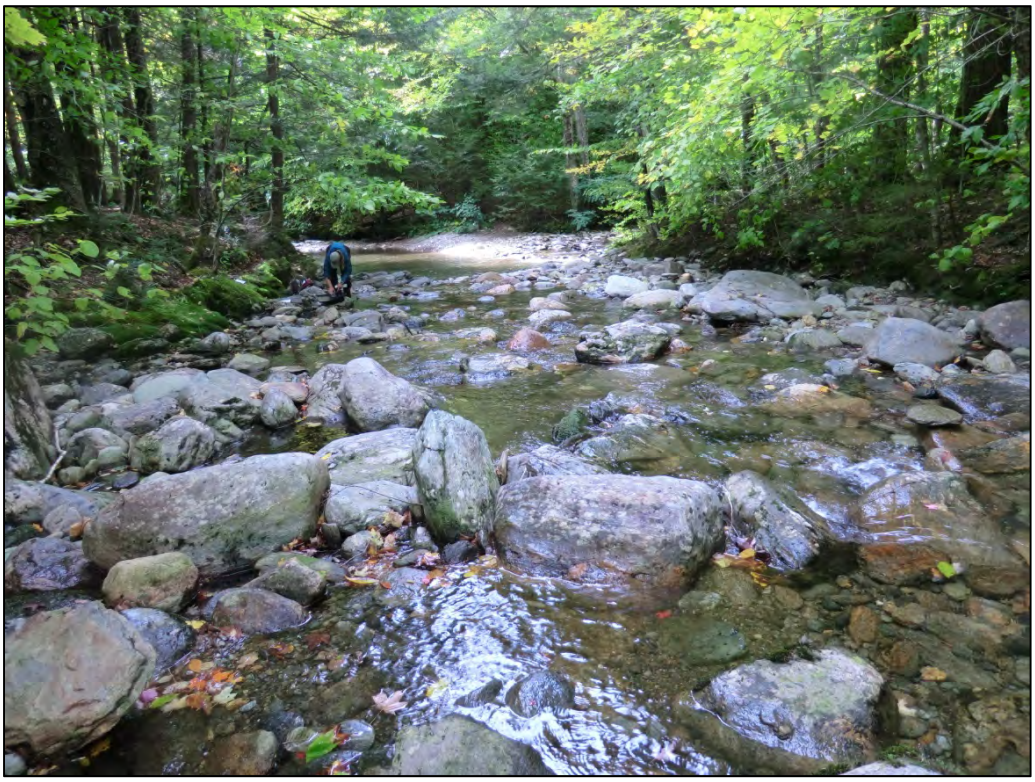

Figure 33. Pinnacle Brook monitoring station (9/22/14).

9.2 Macrobenthic Results

The macroinvertebrate taxa list for the duplicate kick net samples collected during fall 2014 are found in Appendix 4 on pages 15 through 21. The macroinvertebrate kick net samples were processed and identified by Catherine Szal. Bear Creek Environmental, LLC calculated the biometrics for the samples, which underwent a quality control review by DEC aquatic biologist, Steve Fiske. A summary of the biometrics, percent composition of the orders, and percent composition of the functional feeding groups for each station is included on pages 22 through 35 of Appendix 4.

All biomonitoring stations sampled during 2014 in the vicinity of SMR are located below 2,500 feet in elevation. All seven sampling stations fall into the stream type "small-size high gradient" (SHG). For this reason, the Class B (2-3) scoring guidelines for SHG were applied. The outcomes of the scoring guidelines are summarized in Tables 8 through 14 below. The Class B2-3 threshold values are provided at the bottom of each table. Sampling dates where the biological integrity is good or better and the samples meet Class B biocriteria are highlighted in green.

West Branch of Little River – RM 8.8: Station RM8.8 is located at the picnic area in Smugglers Notch off of Route 108. This is the fourth year the West Branch upstream of Stowe Mountain Resort has been sampled by Stowe Mountain Resort. Steve Fiske of the Vermont DEC also sampled the West Branch above the resort in the vicinity of RM8.8 in early September 2007 and 2011. The biometrics for September 2014 indicates West Branch station RM8.8 has good biological integrity. This background/control station passed the Class B2-3 biocriteria in 2014 with EPT Richness meeting the threshold criteria of 16. The mean EPT Richness has been below the threshold value of 16 for four of the six sampling dates. The low EPT Richness values may be attributed to impacts from acid precipitation. This station has a low alkalinity (poor buffering capacity).

Table 8. Macroinvertebrate Results
West Branch of Little River RM 8.8
Picnic Area off of Route 108 in the Notch

Year	Density	Richness	EPT	PMA-O	BI	% Oligo.	EPT/ EPT+C	PPCS-FG	Outcome
9/7/2007 DEC	1124.5	30	**14**	77.4	2.37	0.3	0.75	0.63	Class B2-3 Not Supported: Fair
9/9/2011[1] DEC	379.2	36	19	63.8	2.18	1.6	0.77	**0.38**	Class B2-3 Supported: Good
9/28/2011[1] BCE	**275.5**	**23.5**	**15.5**	54	1.12	0.0	0.91	**0.35**	Class B2-3 Not Supported: Fair
9/16/12 BCE	427.2	**24.5**	**15.5**	61.3	1.19	0.2	0.88	0.46	Class B2-3 Not Supported: Fair to Good
9/19/13 BCE	369.4	27.0	**15.5**	63.5	1.98	0.0	0.88	0.43	Indeterminate (+) for Class B2-3: Good to Fair

Table 8. Macroinvertebrate Results
West Branch of Little River RM 8.8
Picnic Area off of Route 108 in the Notch

Year	Density	Richness	EPT	PMA-O	BI	% Oligo.	EPT/ EPT+C	PPCS-FG	Outcome
9/22/14 BCE	501.8	27.5	17.5	66.0	1.90	0.50	0.79	0.47	Class B2-3 Supported: Good
Annual Mean 2006-2014	550.1	27.9	16.1	65.4	1.82	0.4	0.83	0.47	Good to Fair
Annual Mean 2006-2009	1124.5	30.0	**14.0**	77.5	2.37	0.3	0.75	0.63	Fair
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥0.40	

Bold denotes value does not meet the proposed macroinvertebrate biocriteria threshold
[1]Large flood event in August 2011
Note: DEC and BCE station locations are not exact, but are within the same reach

West Branch of Little River – RM 8.0: The upper West Branch station was added in 2006 to provide a control station on the West Branch that is located above the discharge from the Mount Mansfield sedimentation basin. Kick net sampling was conducted by both the Vermont DEC and Bear Creek Environmental, LLC on September 22, 2014. The Vermont DEC data shows the percentage of worms (Oligochaeta) were higher than the threshold value of 12, resulting in an outcome of "fair" biological integrity. The BCE kick net samples contained a percentage of worms just under the threshold value, meeting Class B2-3 biocriteria. Both the DEC and BCE samples suggest that sedimentation (e.g. sand) may be an issue at RM 8.0 due to the high percentage of worms. Other stressors include the strong iron seeps at this station and the low buffering capacity. The alkalinity at West Branch RM 8.0 has averaged only 5.7 mg/L as CaCO3, suggesting the station is acid stressed. Water chemistry data samples collected within the past five years have shown pH values in the 4 to 6 s.u. range on multiple occasions, showing this West Branch in this location is affected by acidic pulses. Given all these challenges, the macroinvertebrate community had fair to good biological integrity in 2014.

Table 9. Macroinvertebrate Results
West Branch of Little River RM 8.0 (MS-16b)
Above Discharge from Mount Mansfield Parking Area

Year	Density	Richness	EPT	PMA -O	BI	% Oligo.	EPT/ EPT+C	PPCS -FG	Outcome
10/10/2006 BCE	**199.5**	**26**	**13.5**	65	2.19	10.0	0.89	0.61	Class B2-3 Not Supported: Fair
9/7/2007 BCE	682	**26**	**15.0**	60	3.01	**13.0**	0.93	0.42	Indeterminate for Class B2-3: Fair
9/7/2007 ANR	1204	33	**14.0**	63	3.50	8.0	0.87	**0.36**	Class B2-3 Not Supported: Fair
9/12/2008 BCE	**184.5**	**24.0**	**13.5**	65	3.38	9.3	0.93	**0.34**	Class B2-3 Not Supported: Fair
9/10/2009 BCE	567	**23.5**	**14.5**	69	3.29	1.5	0.94	0.55	Class B2-3 Not Supported: Fair
9/27/2010[1] BCE	**77**	**15.5**	**9.0**	59.5	2.13	0.8	0.90	**0.35**	Class B2-3 Not Supported: Poor
9/28/2011[1] BCE	**89.5**	**20.0**	**13.5**	67	2.13	6.1	0.91	0.52	Class B2-3 Not Supported: Poor
9/16/2012 BCE	399.5	29.5	17.5	78.3	2.49	2.7	0.89	0.46	Class B2-3 Supported: Good
10/24/12[2] DEC	837.0	30.0	17.0	68.1	2.58	8.2	0.69	**0.34**	Class B2-3 Not Supported: Fair to Good
9/19/2013 BCE	**160.5**	**24.5**	**14.0**	67.2	2.98	3.8	0.87	**0.32**	Class B2-3 Not Supported: Fair
9/22/14 DEC[3]	434.7	35.0	16.0	56.9	3.78	**17.5**	0.93	0.40	Class B2-3 Not Supported: Fair
9/22/14 BCE	469.7	30.0	19.0	60.3	3.71	11.2	0.95	0.45	Class B2-3 Supported: Good
Annual Mean (2006-2014)	365.6	**25.0**	**14.1**	65.1	2.85	6.9	0.90	0.43	Fair
Annual Mean (2006-2009)	473.5	**25.8**	**14.0**	65.2	3.03	7.8	0.91	0.47	Fair
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥0.40	

Bold denotes value does not meet the proposed macroinvertebrate biocriteria threshold
[1]Large flood events in August 2010 and August 2011
[2]Sampled five days following a freshet event.
[3]One replicate only

West Branch of Little River RM 7.5: The middle West Branch station is located below the discharge from the Mt. Mansfield sedimentation basin. The September 2014 kick net results were found to meet the Class B biocriteria with the exception of the PPCS-FG metric. The low PPCS-FG is due to a shift in dominance toward two groups: collector gatherers, shredder detritivores, and predators (stoneflies). This shift is common in high gradient streams that are affected by acidic pulses (low pH). For this reason, BCE made the determination that the station meets Class B2-3 biocriteria.

Table 10. Macroinvertebrate Results
West Branch of Little River RM7.5 (MS-8)
Below Lower Entrance to Mount Mansfield (Above Big Spruce Brook Confluence)

Year	Density	Richness	EPT	PMA-O	BI	% Oligo.	EPT/ EPT+C	PPCS -FG	Outcome
Sept. 2000 PEA	**118**	**24.5**	**13**	55	2.08	1.9	0.76	0.40	Class B2-3 Not Supported: Fair
Sept. 2000 VANR	605	**22**	**12**	55	3.13	0.0	0.70	**0.39**	Class B2-3 Not Supported: Fair
Sept. 2001 VANR	**130**	**25.5**	**15**	72	2.68	0.40	0.80	0.47	Class B2-3 Not Supported: Fair
Oct. 2003 PEA[1]	**123.5**	**18.5**	**8.5**	49	3.56	**44.0**	0.57	0.41	Class B2-3 Not Supported: Poor
Nov. 2004 PEA	**165.5**	**25**	**14**	58	1.45	**14.1**	0.90	0.54	Class B2-3 Not Supported: Fair
Sept. 2005 BCE	**179**	34	**15**	73	2.19	**23**	0.80	0.47	Class B2-3 Not Supported: Fair
10/10/2006 BCE	**185.5**	**26**	17	64	1.76	5.9	0.91	0.60	Class B2-3 Not Supported: Fair
9/7/2007 BCE	629	28.5	17.5	65	2.28	3.3	0.93	0.44	Class B2-3 Supported: Good
9/12/2008 BCE	**213.5**	**26.5**	16.0	67	2.89	2.5	0.91	0.48	Class B2-3 Not Supported: Fair
9/10/2009 BCE	477.5	28	16.5	71	2.45	1.8	0.86	0.44	Class B2-3 Supported: Good
9/26/2009 BCE	350.0	28.5	19.0	70	1.95	1.7	0.90	0.50	Class B2-3 Supported: Good
9/27/2010[2] BCE	**88**	**23**	**14.5**	65	2.63	7.3	0.92	0.49	Class B2-3 Not Supported: Poor

Table 10. Macroinvertebrate Results
West Branch of Little River RM7.5 (MS-8)
Below Lower Entrance to Mount Mansfield (Above Big Spruce Brook Confluence)

Year	Density	Richness	EPT	PMA-O	BI	% Oligo.	EPT/ EPT+C	PPCS -FG	Outcome
9/28/2011[2] BCE	**99.5**	**19.5**	**13**	68	2.23	1.5	0.88	0.51	Class B2-3 Not Supported: Poor
9/16/12 BCE	417.3	30.0	18.0	69.4	2.83	0.6	0.91	0.43	Class B2-3 Supported: Good
9/19/2013 BCE	**260.5**	33.0	19.0	66.8	2.39	**12.5**	0.88	0.41	Indeterminate for Class B2-3 (Fair to Good)
9/22/14 BCE	344.2	29.5	18.5	68.0	2.19	8.4	0.91	**0.36**	Class B2-3 Supported: Good
Annual Mean (2006-2014)	**294.6**	27.1	16.8	67.1	2.38	4.9	0.90	0.47	Fair
Annual Mean (2006-2009)	360.4	27.3	17.1	66.6	2.28	3.4	0.91	0.50	Good
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥0.40	

Bold denotes value does not meet the proposed macroinvertebrate biocriteria threshold
[1] Petroleum spill in 2003
[2]Large flood event in August 2010

West Branch of Little River (RM 6.5): The lower West Branch station has passed the Class B2-3 in eight of the thirteen years sampled. This is the third consecutive year, since the extreme high flow events in 2010 and 2011 that the metrics for RM6.5 passed the biocriteria. All eight metrics exceeded the threshold values, and the macroinvertebrate community was found to be of good biological integrity.

Table 11. Macroinvertebrate Results
West Branch of Little River RM 6.5 (MS-14)
Above Pinnacle Brook

Year	Density	Richness	EPT	PMA-O	BI	% Oligo.	EPT/ EPT+C	PPCS -FG	Outcome
Sept. 2000 PEA	420	38	21	70	3.35	0.4	0.69	0.44	Class B1 Supported: V.Good
Oct. 2003[1] PEA	**135**	24.5	**14**	58	3.62	**19.5**	0.64	0.56	Class B2-3 Not Supported: Fair
Nov. 2004 PEA	364	38	23.5	65	3.01	**14.1**	0.90	0.65	Indeterminate
Sept. 2005 BCE & DEC	352	43	24	80	1.91	9.2	0.83	0.52	Class B2-3 Supported: Good
10/10/2006 BCE	**212**	30.5	20.5	70	1.86	1.8	0.90	0.67	Class B2-3 Not Supported:

Table 11. Macroinvertebrate Results
West Branch of Little River RM 6.5 (MS-14)
Above Pinnacle Brook

Year	Density	Richness	EPT	PMA-O	BI	% Oligo.	EPT/ EPT+C	PPCS -FG	Outcome
									Fair
9/7/2007 BCE	626	27	16.0	81	2.06	1.8	0.91	0.59	Class B2-3 Supported: Good
9/12/2008 BCE	**272**	**25**	**15.0**	64	3.40	2.7	0.95	0.52	Class B2-3 Not Supported: Fair
9/12/2008 DEC	302	35	20	73.7	2.90	1.7	0.91	0.60	Class B2-3 Supported: Good
9/10/2009 BCE	593	30	18.5	74.7	2.47	0	0.90	0.52	Class B2-3 Supported: VG to Good
9/11/2009 DEC	694.5	44	26	76.7	2.86	1.7	0.87	0.59	Class B1 Supported: VG to Exc.
9/27/2010[2] BCE	**158.5**	31.5	21.5	64	2.67	2.0	0.95	0.53	Class B2-3 Not Supported: Fair
9/9/2011[2] DEC	**266**	43	23	69.7	3.45	1.9	0.92	0.62	Class B2-3 Not Supported: Fair
9/28/2011[2] BCE	**207.5**	**25.5**	18	53	3.98	0.6	0.96	0.41	Class B2-3 Not Supported: Fair
8/30/2012 DEC	936.0	39.7	23.7	71.5	2.67	1.0	0.84	0.49	Class B1 Supported: V.Good
9/16/2012 BCE	340.9	34.5	22.0	73.0	2.47	1.2	0.83	0.45	Class B2-3 Supported: Good
10/24/12[3] DEC	589.5	42.0	29.0	60.5	1.64	3.6	0.93	**0.29**	Class B2-3 Not Supported: Fair to good
9/19/13[4] BCE	350.2	35.0	22.5	69.5	2.67	3.1	0.89	**0.39**	Class B2-3 Supported: Good
9/22/14 BCE	354.3	33.0	21.5	65.1	3.17	2.4	0.93	0.49	Class B2-3 Supported: Good
Annual Mean (2006-2014)	387.8	33.0	20.8	69.3	2.69	1.9	0.91	0.52	Good
Annual Mean (2006-2009)	442.2	31.1	19.1	73.9	2.43	1.7	0.91	0.59	Good
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥0.40	

Bold denotes value does not meet the proposed macroinvertebrate biocriteria threshold
[1] Petroleum spill in 2003
[2]Large flood event in August 2010
[3]Sampled five days after a freshet event
[4]PPCS slightly under threshold value of 0.40 with very good EPT and Richness numbers.

Big Spruce RM 0.3: A biomonitoring station was added on Big Spruce Brook during 2006 to provide a second set of data to evaluate compliance with Class B2-3 biocriteria. Four of the eight metrics fell below the threshold value for Class B2-3 biocriteria at Big Spruce RM 0.3 in 2014. The headwaters of Big Spruce Brook are critically acidified, and it is likely that the macroinvertebrate communities have low density and low richness. The strong iron seeps, specifically the iron precipitate in the stream, likely plays a role in further suppressing the macrobenthic community resulting in low density and richness values at stations RM 0.3 and RM 0.2. The biological integrity was rated as fair to poor.

Table 12. Macroinvertebrate Results
Big Spruce Brook RM 0.3 (MS10-a)
Upstream of Club House

Year	Density	Richness	EPT	PMA-O	BI	% Oligo.	EPT/ EPT+C	PPCS-FG	Outcome
10/10/2006 BCE	**207**	29.5	17.5	72	2.77	0.5	0.89	0.46	Class B2-3 Not Supported: Fair
9/7/2007 BCE	314.5	36.5	20.5	84	2.04	0.1	0.78	0.64	Class B2-3 Supported: Good
9/12/2008 BCE	**125**	**25.5**	**12.0**	72	1.59	1.5	0.87	0.44	Class B2-3 Not Supported: Fair
9/10/2009 BCE	358.5	**25.5**	**13.0**	79	2.38	0.3	0.68	0.50	Class B2-3 Not Supported: Fair
9/27/2010[1] BCE	**64**	**20.0**	**13.0**	66	2.44	3.1	0.77	0.53	Class B2-3 Not Supported: Poor
9/28/2011[1] BCE[1]	**99**	**22.0**	**13.0**	74	2.50	3.0	0.90	0.41	Class B2-3 Not Supported: Poor
9/16/2012 BCE	346.0	38.0	20.0	56.3	3.17	1.2	0.45	0.48	Class B2-3 Supported: Good
9/19/2013 BCE	**116**	30.0	16.0	68.4	2.10	0.0	0.84	0.44	Class B2-3 Not Supported: Poor to Fair
9/22/14 BCE	**132**	**25.0**	**11.0**	47.8	1.71	5.3	0.66	**0.38**	Class B2-3 Not Supported: Fair to Poor
Annual Mean (2006-2014)	**195.8**	28.0	**15.1**	68.8	2.30	1.7	0.76	0.48	Fair
Annual Mean (2006-2009)	**251.3**	29.3	**15.8**	76.8	2.20	0.6	0.81	0.51	Fair
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥0.40	

Bold denotes value does not meet the proposed macroinvertebrate biocriteria threshold; [1]Large flood event in August 2010

Big Spruce - RM0.2: The geomorphic stability and habitat of Big Spruce at RM0.2 was greatly impacted by extreme high flow events that took place during 2010 and 2011. Channel adjustment processes in response to those events have been noted (Nealon, 2012) The results of the kick net sampling indicate the macroinvertebrate community at Big Spruce RM0.2 has not rebounded since the extreme high events of 2010 and 2011. Similar to 2013, the Density and EPT Richness fell below the Class B2-3 threshold value in 2014.

Table 13. Macroinvertebrate Results
Big Spruce Brook RM0.2 (MS-10)
At Mouth

Year	Density	Richness	EPT	PMA-O	BI	% Oligo.	EPT/ EPT+C	PPCS-FG	Outcome
Sept. 2000 PEA	**207**	39.5	20.5	71	3.45	2.7	0.66	0.62	Class B2-3 Not Supported: Fair
Oct. 2003 PEA	**261**	35	21	60	1.76	1.5	0.76	0.45	Class B2-3 Not Supported: Good to Fair
Nov. 2004 PEA	1224	35	**14**	**44**	4.24	2.0	**0.26**	0.48	Class B2-3 Not Supported: Fair
Sept. 2005 BCE	**209**	44	19	67	2.45	**12.6**	0.70	0.56	Class B2-3 Not Supported: Fair
10/10/2006 BCE	**181.5**	**24**	**14.5**	69	2.74	0.3	0.84	0.45	Class B2-3 Not Supported: Fair
9/7/2007 BCE	500.5	29.5	18.0	77	2.37	0	0.67	0.48	Class B2-3 Supported: Good
9/12/2008 BCE	**225**	29.5	17.0	83	2.27	0.2	0.87	0.56	Class B2-3 Not Supported: Fair to good
9/10/2009 BCE	474.5	29.0	17.5	83	2.93	0.8	0.71	0.52	Class B2-3 Supported: Good
9/26/2009 BCE	322.5	35.5	22.0	80	1.87	0.5	0.88	0.62	Class B2-3 Supported: Good
9/27/2010[1] BCE	**105**	**25.5**	**14.5**	70	3.44	0.5	0.65	0.65	Class B2-3 Not Supported: Fair to Poor
9/28/2011[1] BCE	**166.5**	36	19.5	73	2.84	3.6	0.70	0.52	Class B2-3 Not Supported: Fair
9/16/2012 BCE	**187.0**	32.5	17.5	63.5	2.49	0.9	0.66	0.44	Class B2-3 Not Supported: Fair
9/19/2013 BCE	**176.0**	32	**15.5**	64.6	2.62	2.8	0.75	0.44	Class B2-3 Not Supported: Fair

Table 13. Macroinvertebrate Results Big Spruce Brook RM0.2 (MS-10) At Mouth									
Year	**Density**	**Richness**	**EPT**	**PMA-O**	**BI**	**% Oligo.**	**EPT/ EPT+C**	**PPCS-FG**	**Outcome**
9/22/14 BCE	**153.5**	28.5	**14.5**	61.7	1.98	3.0	0.76	0.42	Class B2-3 Not Supported: Fair
Annual Mean (2006-2014)	**267.6**	31.6	17.9	76.5	2.68	1.2	0.79	0.54	Good to Fair
Annual Mean (2006-2009)	326.4	28.0	16.8	78.0	2.58	0.3	0.77	0.50	Good to Fair
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥0.40	
Bold denotes value does not meet the proposed macroinvertebrate biocriteria threshold [1]Large flood event in August 2010									

Pinnacle Brook – RM0.1: Pinnacle Brook acts as a local control/reference station for the other biomonitoring stations at Stowe Mountain Resort. The 2014 macroinvertebrate results from the lower Pinnacle Brook station indicate the biological integrity was very good as summarized in Table 13. Although the Pinnacle Brook and Ranch Brook are located adjacent to the West Branch watershed, these drainages appeared to have been spared the extreme high flows events and localized flooding that took place on August 4, 2010 within the West Branch watershed.

Table 14. Macroinvertebrate Results Pinnacle Brook MS-13 At Mouth									
Year	**Density**	**Richness**	**EPT**	**PMA-O**	**BI**	**% Oligo.**	**EPT/ EPT+C**	**PPCS-FG**	**Outcome**
Sept. 2000 PEA	714	35.5	21.5	72	2.05	0.0	0.68	0.56	Class A1 Supported: Exc.
Oct. 2003 PEA	1098	28	16.5	65	1.20	0.4	0.91	0.40	Class B2-3 Supported: Good
Nov. 2004 PEA	499	32.5	17.5	58	2.17	3.1	0.76	0.53	Class B2-3 Supported: Good
Sept. 2005 BCE	601	53	22	67	2.43	**14.0**[1]	0.64	0.47	Class B2-3 Supported: Very Good to good
10/10/2006 BCE	499	30	18	70	1.61	0	0.90	0.65	Class B2-3 Supported: Good

Table 14. Macroinvertebrate Results
Pinnacle Brook MS-13 At Mouth

Year	Density	Richness	EPT	PMA-O	BI	% Oligo.	EPT/ EPT+C	PPCS-FG	Outcome
9/7/2007 BCE	791.5	28	18	79	2.00	0	0.79	0.58	Class B2-3 Supported: Good
9/12/2008 BCE	411.5	33.5	17.5	61	2.58	1.5	0.64	**0.39**[2]	Class B2-3: Good
9/10/2009 BCE	649.5	30	18	74	3.17	0.2	0.68	0.68	Class B2-3 Supported: Good to very good
9/27/2010 BCE	439	30.5	19	80	1.94	0.6	0.75	0.56	Class B2-3 Supported: Good to very good
9/28/2011[3] BCE	320.5	28.5	17.5	69	2.01	0.4	0.83	0.45	Class B2-3 Supported: Good
9/16/2012 BCE	607.7	37.5	21.5	77.1	1.97	0	0.74	0.54	Class A1 Supported: Exc.
9/19/13 BCE	412.0	40.5	24.5	77.6	2.56	0.3	0.79	0.45	Class B1 Supported: Very Good
9/22/14 BCE	426.3	35.5	21.0	64.9	2.15	1.0	0.70	0.48	Class B1 Supported: Very Good
Annual Mean (2006-2014)	506.3	32.7	19.4	72.5	2.22	0.4	0.76	0.53	Good to very good
Annual Mean (2006-2009)	587.9	30.4	17.9	71.0	2.34	0.4	0.75	0.58	Good to very good
Class B2-3	≥300	≥27	≥16	≥45	≤4.50	≤12	≥0.45	≥0.40	

[1]high percentage of Oligochaeta in 2005 not associated with deposition (Naididae)
[2]Functional feeding group metric is dissimilar to the reference Class B2-3 community because it is critically acidified. Overall biological integrity is good.
[3]Flood event in late. August 2011 (Tropical Storm Irene)
Bold denotes value does not meet the proposed macroinvertebrate biocriteria threshold

9.3 Fish Population Monitoring

The Vermont Department of Fish and Wildlife (VDFW) has been monitoring wild brook trout populations annually since 1994 at three stations on the West Branch in the vicinity of Stowe Mountain Resort and two stations on Ranch Brook (Figure 34). Monitoring stations are summarized in the following Table 15. Graphs of the number of brook trout per mile (Figure 35 and 36) have been provided courtesy of Rich Kirn, Fisheries Biologist with the VDFW. Based on preliminary review of the data, young-of-the-year wild brook trout populations at the stations generally appear to mirror each other. The mean number of young-of-the-year brook trout per mile from 1997 through 2014 is highest on West Branch 10 (1596) and West Branch 20 (1229). The other three stations (Ranch 10, Ranch 20 and West Branch 23) have similar densities of young-of-the-year trout in the range of 830 to 1000 fish per mile. Mean densities of yearling and older trout for 1997 through 2014 range between 700 to 1100 trout per mile. The results indicate there is a healthy wild brook trout population in the West Branch in the vicinity of Stowe Mountain Resort. The data for young-of-the-year and yearling and older is provided by year on pages 36 and 37 of Appendix 4.

Table 15. Vermont Fish and Wildlife Department Annual Brook Trout Monitoring Stations

Station	Elevation (feet)	Location
West Branch 10	1550	Near Barnes Camp
West Branch 20	1440	Mansfield Parking Lot Exit
West Branch 23	1410	At Stowe Mountain Resort pump house
Ranch Brook 10	1200	Near Ranch Camp
Ranch Brook 20	960	Above confluence with West Branch

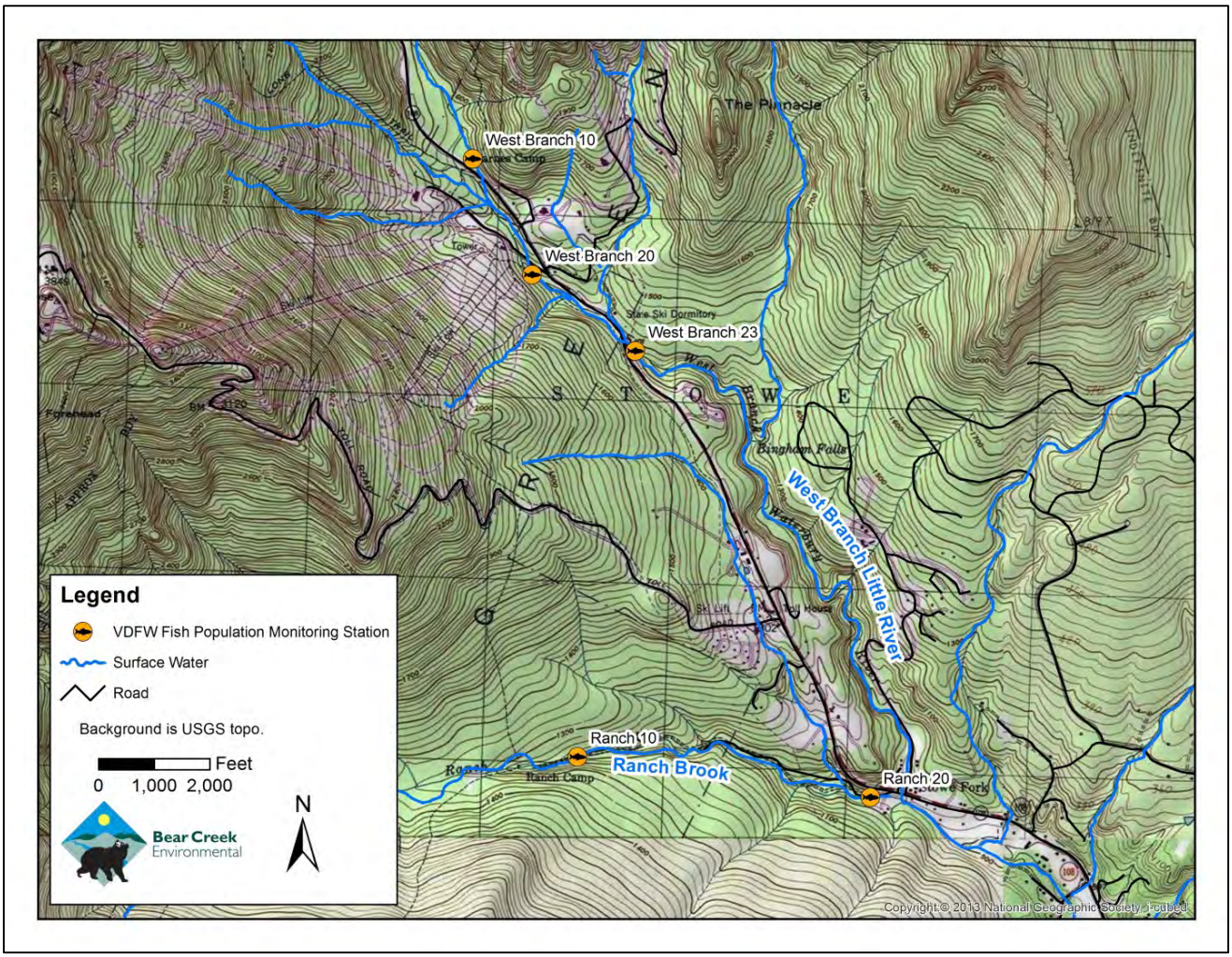

Figure 34. Vermont Fish and Wildlife Department Brook Trout Monitoring Stations

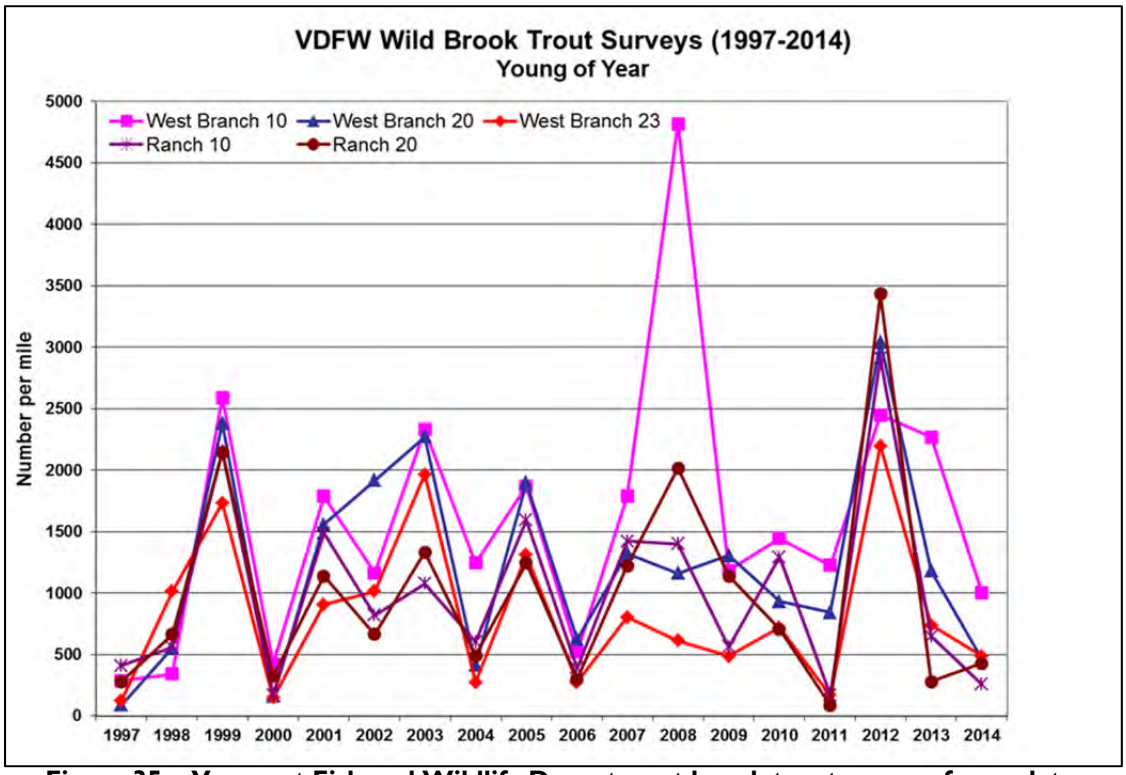

Figure 35. Vermont Fish and Wildlife Department brook trout young of year data.

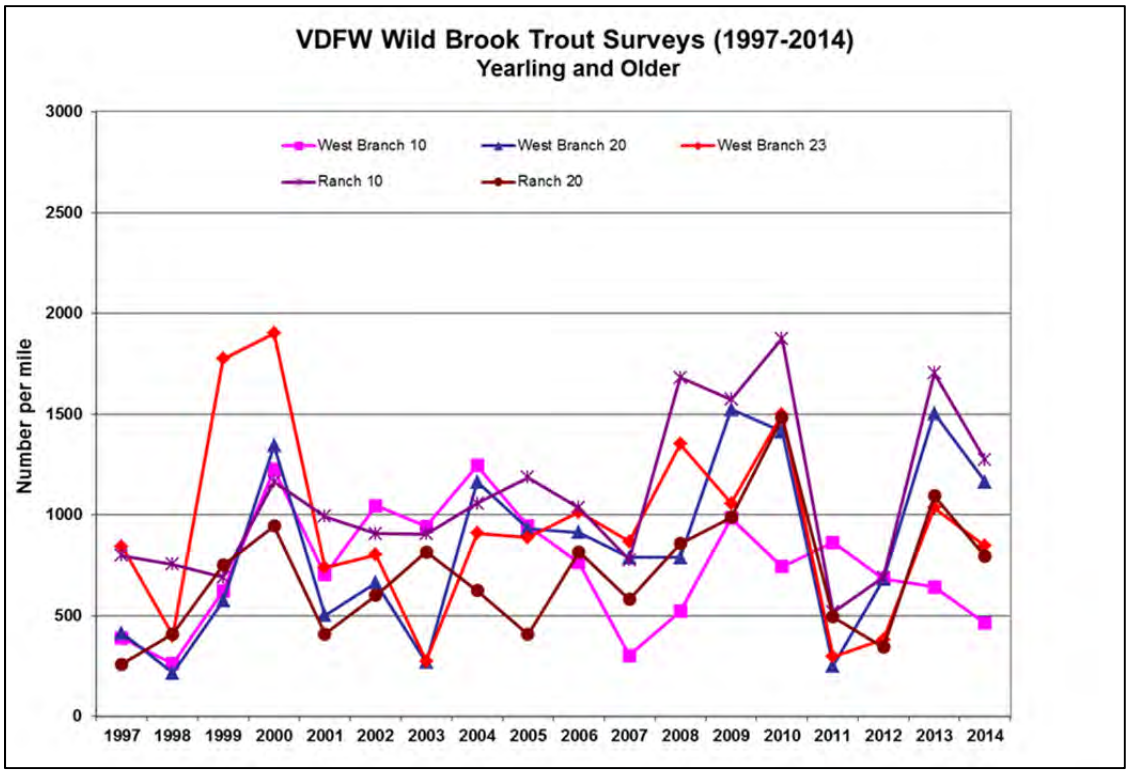

Figure 36. Vermont Fish and Wildlife Department brook trout yearling and older data.

10.0 WATER QUALITY SUMMARY

This section presents a water quality summary of the assessment streams based on field observations, biomonitoring data and water chemistry data.

10.1 West Branch of the Little River

The water quality summary for the three West Branch monitoring stations is provided in Table 16.

Table 16. West Branch of Little River Water Quality Summary (2014)

Station	Location	Category				Water Quality Concerns
		Physical	Water Chemistry	Sediment Targets	Aquatic Life Support (Class B Biocriteria	
WB8.8	Above SMR in picnic area	Good habitat	Low alkalinity	Meets all three targets	Class B2-3 supported	None
WB8.0 (MS-16B)	Above Mount Mansfield sedimentation basin	Fair habitat quality, hydrologic regime (stormwater improvements in 2012)	Low alkalinity	Meets all three targets	Class B2-3 supported (BCE samples) – non supported DEC samples	Iron seep, sand
WB7.5 (MS-8)	Above Big Spruce Confluence	Hydrologic regime (stormwater improvements in 2012)	Low alkalinity	Meets all three targets	Class B2-3 supported	Light iron staining; moderate silt rating
WB6.5 (MS-14)	Above Pinnacle Brook Confluence	Hydrologic regime (stormwater improvements in 2012)	Low alkalinity	Meets all three targets	Class B2-3 supported	None

10.2 Big Spruce Brook

Field observations, water chemistry data, and biomonitoring data provide evidence that Big Spruce is impacted by sediment and iron (Table 17). Sources of sediment at the Big Spruce sampling stations during 2014-2015 include eroding stream banks and discharges from the Big Spruce Sediment Basin. The iron seep, located at Big Spruce Brook RM 0.3 was remediated in fall 2010, and monitoring will continue to evaluate the success of the limestone treatment. SMR took additional measures in 2012 to improve stormwater treatment at the Sensation Lot. The resort continues to evaluate the effectiveness of these measures and is investigating system additions and improvements.

Table 17. Big Spruce Watershed Water Quality Summary (2014)

Station	Location	Category				Water Quality Concerns
		Physical Habitat	Water Chemistry	Sediment Targets	Aquatic Life Support (Class B Biocriteria	
BS0.3 (MS-10A)	Big Spruce upstream of Little Spruce	Hydrologic regime; Ski Club Brook channel instability	Moderate alkalinity; Big Spruce Basin outflow	Meets all three targets	Class B2-3 not supported	Iron seeps
BS0.2 (MS-10)	Big Spruce at mouth	Eroding stream banks; Hydrologic regime	Moderate alkalinity	Meets all three targets	Class B2-3 not supported	Iron seeps

10.3 Pinnacle Brook

The habitat survey, biomonitoring data, and water quality data for fall 2014 provide evidence that Pinnacle Brook is not being impacted by the golf course, the stump dump or the gravel pit. The lower Pinnacle Brook station met the Class B2-3 biocriteria in 2014 and has very good biological integrity (Table 18).

Table 18. Pinnacle Brook Watershed Water Quality Summary (2014)						
Station	**Location**	**Category**				**Water Quality Concerns**
		Physical	**Water Chemistry**	**Sediment Targets**	**Aquatic Life Support (Class B Biocriteria**	
PB0.1 (MS-13)	Lower Pinnacle Brook	Stable banks, good riparian corridor	Low alkalinity	Meets all three targets	Class B2-3 supported	Critically acidified

11.0 PROPOSED 2015-2016 MONITORING

The proposed 2015-2016 monitoring design is provided in Table 19. The proposed stations are consistent with the revised monitoring plan dated December 3, 2012 (Nealon, 2012).

Table 19. 2015-2016 Water Quality Monitoring Stations at Stowe Mountain Resort					
Station	**Location**	**Monitoring Parameter**			
		Baseflow	**Turbidity**	**Sediment (pebble counts)**	**Biomonitoring**
WB8.8	West Branch above the resort in the picnic area	+		+	+
WB8.2	West Branch above Barnes Camp		+		
WB8.0 (MS-16B)	West Branch below Barnes Camp	+	+	+	+
WB7.5 (MS-8)	West Branch above Big Spruce	✓	✓	✓	✓
WB6.9	West Branch below snowmaking pond outlet		✓		
WB6.5 (MS-14)	West Branch above Pinnacle Brook confluence	✓		✓	✓
LT0.1	Long Trail Brook at Mansfield Entrance	X	+		
GB0.1	Gondola Brook at Mansfield Entrance	X	+		

Table 19. 2015-2016 Water Quality Monitoring Stations at Stowe Mountain Resort					
Station	**Location**	**Monitoring Parameter**			
		Baseflow	**Turbidity**	**Sediment (pebble counts)**	**Biomonitoring**
BS0.9 (MS-9)	Big Spruce Brook below ski trails		+		
BS0.7	Big Spruce above Big Spruce Basin		+		
BS0.3 (MS-10A)	Big Spruce upstream of Club House	+	+	+	+
BS0.2 (MS-10)	Big Spruce Brook at mouth	✓	✓	✓	✓
LS0.1 (MS-11)	Little Spruce Brook near mouth	X	+		
PB0.2 (MS-13)	Lower Pinnacle Brook	+		+	+
SC0.2	Upper Ski Club Brook		+		
SC0.1	Lower Ski Club Brook		+		
Outlet 1	Mansfield Basin		+		
Outlet 2	Snowmaking Pond		+		
Outlet 3	Big Spruce Basin		+		
Outlet 4	Mansfield Exit Basin		+		
Outlet 5	Upper Barnes Camp Basin Outlet[1]		+		
Outlet 6	Lower Barnes Camp Basin Outlet[1]		+		

+ - additional voluntary monitoring by Stowe Mountain Resort not required in Settlement Agreement
X – Station added per request of Steve Fiske (email of October 1, 2012)
[1] Basin outlet sampled only if there is a discharge to waters of the state.

Table 20 provides a schedule of tasks and products proposed for the 2015-2016 monitoring and reporting season. The spring 2015 to spring 2016 period represents the thirteenth year of monitoring during construction and is the fourteenth year of monitoring since 2000 when the project was initiated.

Table 20. 2015-2016 Schedule of Tasks and Products	
Date	**Task**
June 2015-May 2016	Event-based water chemistry sampling (4 rounds - approximately one per season)
Late summer/early fall 2015	One round of base flow water chemistry sampling at 10 stations
September/October 2015	Substrate assessment (pebble counts) at biomonitoring stations
September/October 2015	Macroinvertebrate kicknet sampling/habitat survey
May 2016	Submit annual report for construction year 13

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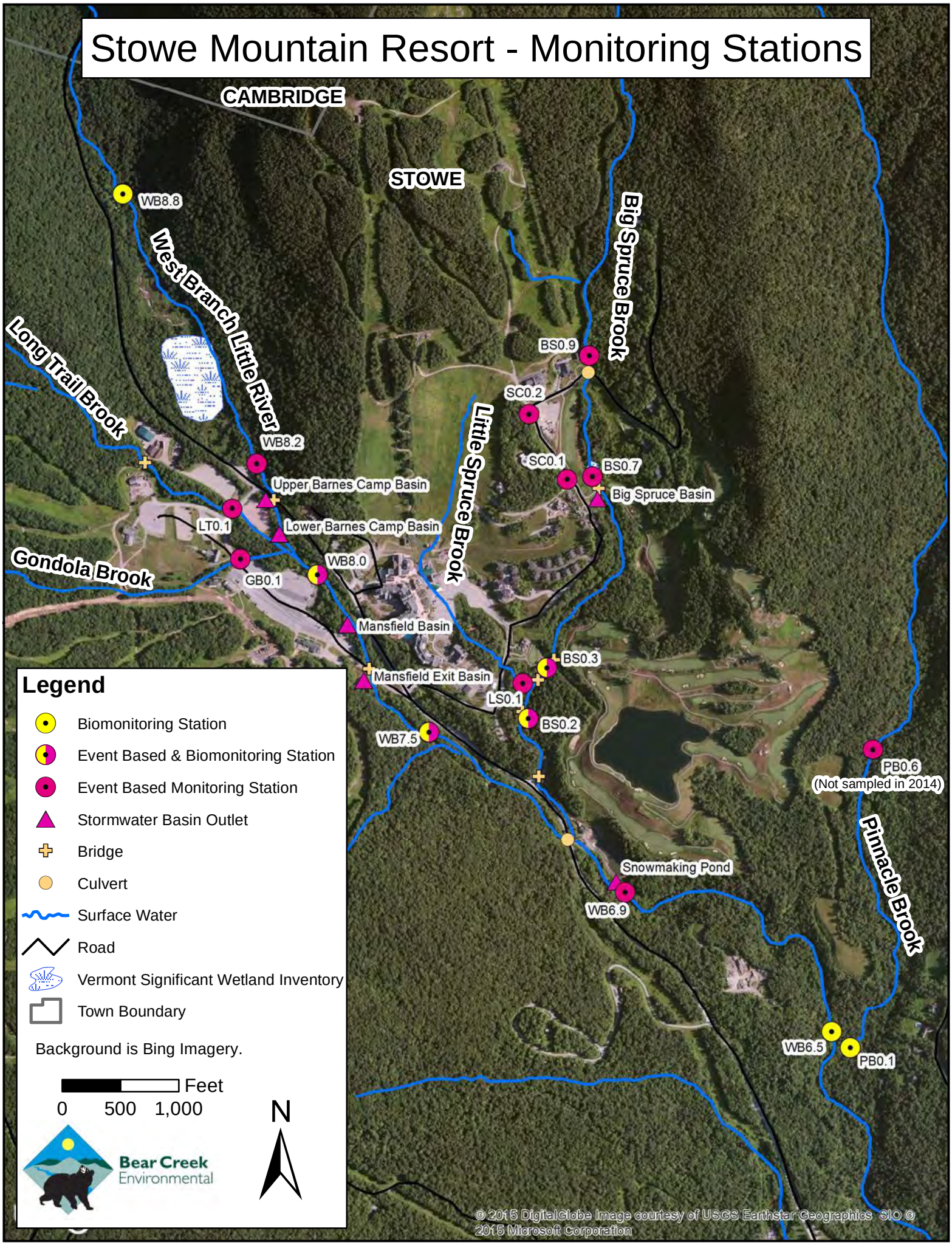
APPENDIX I

WATER CHEMISTRY


Stowe Mountain Resort - Monitoring Stations
CAMBRIDGE
STOWE
WB8.8
West Branch Little River
Long Trail Brook
Big Spruce Brook
BS0.9
SC0.2
Little Spruce Brook
WB8.2
SC0.1
BS0.7
Upper Barnes Camp Basin
Big Spruce Basin
LT0.1
Lower Barnes Camp Basin
Gondola Brook
WB8.0
GB0.1
Mansfield Basin
BS0.3
Mansfield Exit Basin
LS0.1
BS0.2
WB7.5
PB0.6
(Not sampled in 2014)
Pinnacle Brook
Snowmaking Pond
WB6.9
WB6.5
PB0.1
Legend
Biomonitoring Station
Event Based & Biomonitoring Station
Event Based Monitoring Station
Stormwater Basin Outlet
Bridge
Culvert
Surface Water
Road
Vermont Significant Wetland Inventory
Town Boundary
Background is Bing Imagery.
Feet
0 500 1,000
N
Bear Creek Environmental
© 2015 DigitalGlobe Image courtesy of USGS Earthstar Geographics SIO © 2015 Microsoft Corporation

Stowe Mountain Resort
Monitoring Station Baseflow Chemsitry
Station: WBRM8.8
West Branch above the resort in picnic area

DATE		ALK mg/L	pH s.u.		Chloride mg/L		NO3 mg/L	TKN mg/L		TP mg/L		TDP mg/L	Cond. umho/cm	TEMP DEG C
9/21/2011		7.1	8.08	<	2.5		0.36	0.11		0.005	<	0.005	28.1	9.7
9/13/2012		6.5	6.75	<	2.5		0.67	0.11	<	0.005		0.005	33.5	10.3
9/19/2013	<	2	6.84	<	2.5		0.43	0.17	<	0.005			30.7	8.7
9/22/2014		6.1	6.9	<	2.5	*	0.46	0.16	# <	0.4			30.7	7.1
2011-2014 SUMMARY														
	Mean	5.4	6.94	<	2.5		0.48	0.14		0.005	<	0.005	30.8	9.0
	Max	7.1	8.08	<	2.5		0.67	0.17		0.005		0.005	33.5	10.3
	Min	< 2.0	6.75	<	2.5		0.36	0.11	<	0.005	<	0.005	28.1	8.7
	n	4	4		4		4	4		3		2	4	4

Note: Blank in column indicates sample not analyzed

* = The data set initial low level Line Check analysis at 0.050 mg/L was 78% of the expected target. Closing line check at 0.020 mg/L was 95% of the expected target. Some negative bias may be present.
# = Reporting limit increased. The laboratory has determined the Phosphorous testing protocol during the time period these samples were tested was subject to a random high-bias due to a non-phosphorous contaminant. Although QA elements such as the Lab Control Standard and Method Blank were performing correctly, numerous uncharacteristically high results were noted. This value has been excluded from summary statistics.

Stowe Mountain Resort
Monitoring Station Baseflow Chemistry
Station: LT.01
Long Trail Brook just US of confluence with West Branch

DATE		Alkalinity mg/L		pH s.u.		Chloride mg/L		NO3 mg/L		TKN mg/L		TP mg/L	Cond. umho/cm	TEMP DEG C
9/19/2013		< 2		6.56	<	2.50		0.1		0.1	<	0.005	24.6	11.9
9/22/2014		< 2		7.65	<	2.50	*	0.038		0.21	# <	0.400	21.4	8
2013- 2014 SUMMARY														
	Mean	2.0		6.83	<	2.50		0.069		0.155		0.005	23.0	10.0
	Max	2.0		7.65	<	2.50		0.100		0.210		0.005	24.6	11.9
	Min	< 2.0		6.56	<	2.50	<	0.038	<	0.100	<	0.005	21.4	8.0
	n	2		2		2		2		2		1	2	2

Note: Blank in column indicates sample not analyzed

* = The data set initial low level Line Check analysis at 0.050 mg/L was 78% of the expected target. Closing line check at 0.020 mg/L was 95% of the expected target. Some negative bias may be present.
# = Reporting limit increased. The laboratory has determined the Phosphorous testing protocol during the time period these samples were tested was subject to a random high-bias due to a non-phosphorous contaminant. Although QA elements such as the Lab Control Standard and Method Blank were performing correctly, numerous uncharacteristically high results were noted. This value has been excluded from summary statistics.

Stowe Mountain Resort
Monitoring Station Baseflow Chemistry
Station: GB.01
Gondola Brook just US of confluence with West Branch

DATE		Alkalinity mg/L		pH s.u.		Chloride mg/L		NO3 mg/L		TKN mg/L		TP mg/L	Cond. umho/cm	TEMP DEG C
9/19/2013		< 2		6.75	<	2.50		0.1		0.1	<	0.005	23.4	10.4
9/22/2014		2.4		6.73	<	2.50	*	0.047	<	0.1	# <	0.400	23.1	8
2013-2014 SUMMARY														
	Mean	< 2.2		6.74	<	2.50		0.074		0.100	<	0.005	23.3	9.2
	Max	< 2.4		6.75	<	2.50		0.100		0.100	<	0.005	23.4	10.4
	Min	< 2.0		6.73	<	2.50		0.047	<	0.100	<	0.005	23.1	8.0
	n	2		2		2		2		2		1	2	2

Note: Blank in column indicates sample not analyzed

* = The data set initial low level Line Check analysis at 0.050 mg/L was 78% of the expected target. Closing line check at 0.020 mg/L was 95% of the expected target. Some negative bias may be present.
# = Reporting limit increased. The laboratory has determined the Phosphorous testing protocol during the time period these samples were tested was subject to a random high-bias due to a non-phosphorous contaminant. Although QA elements such as the Lab Control Standard and Method Blank were performing correctly, numerous uncharacteristically high results were noted. This value has been excluded from summary statistics.

Stowe Mountain Resort
Monitoring Station Baseflow Chemsitry
Station: WBRM8.0 (MS-16B)
West Branch above Resort

DATE		ALK mg/L	pH s.u.		Chloride mg/L		NO3 mg/L		TKN mg/L		TP mg/L		TDP mg/L		TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
8/31/2006			7.66	<	2.50		0.225		0.051	<	0.005	<	0.005	<	2	0.02	38.9	11.1
10/17/2006			6.64	<	2.50		0.237		0.060	<	0.005	<	0.005	<	2	0.37	23.1	6.0
2/7/2007		5.2	7.30		3.06												38.4	0.3
7/25/2007		7.0	7.50	<	2.50		0.372	<	0.050	<	0.005	<	0.005				30.4	14
9/25/2007		6.8	7.75		2.70		0.30		0.070	<	0.005	<	0.005				35.7	14.3
1/17/2008		5.0	7.27		5.10												26.7	0.2
8/27/2008		6	6.52	<	2.50		0.30		0.16	<	0.005		0.009				31.1	10.9
10/14/2008		4.4	6.76	<	2.50		0.18		0.10		0.005	<	0.005				29.3	10.3
1/13/2009		8.8	6.25		5.70												30.0	1.3
8/28/2009		6.8	6.85	<	2.50		0.21	<	0.050	<	0.005	<	0.005				30.9	11.5
9/11/2009		6.77	7.35		2.7		0.27		0.18		0.005	<	0.005				33.8	10.5
1/13/2010		5.5	6.73		7.1												36.2	0.4
9/21/2010		4.1	7.45	<	2.5		0.21	<	0.1		0.005	<	0.005				26.9	9.7
9/21/2011		6.0	7.65	<	2.5		0.19	<	0.1		0.018		0.006				28.6	11.5
9/13/2012~		7.7	4.45		3.9		0.34		0.1	<	0.005		0.008				43.7	12.2
9/19/2013	<	2.0	6.73	<	2.5		0.28		0.2	<	0.005						32.9	10.4
9/22/2014		3.5	6.81	<	2.5	*	0.19		0.17	# <	0.4						30	8.5
2006-2014 SUMMARY																		
	Mean	5.7	6.86		3.25		0.254		0.107		0.006		0.006	<	2	0.20	32.2	8.4
	Max	8.8	7.75		7.10		0.372		0.200		0.018		0.009	<	2	0.37	43.7	14.3
	Min	< 2.0	4.45	<	2.50		0.180		0.050	<	0.005	<	0.005	<	2	0.02	23.1	0.2
	n	15	17		17		13		13		12		11		2	2	17	17

Note: Blank in column indicates sample not analyzed
~ = The 9/13/2012 pH value of 4.45 is suspect, as this low pH is not typically seen at baseflow conditions. Endyne staff have confirmed value. This value has been excluded from summary statistics.
* = The data set initial low level Line Check analysis at 0.050 mg/L was 78% of the expected target. Closing line check at 0.020 mg/L was 95% of the expected target. Some negative bias may be present.
# = Reporting limit increased. The laboratory has determined the Phosphorous testing protocol during the time period these samples were tested was subject to a random high-bias due to a non-phosphorous contaminant. Although QA elements such as the Lab Control Standard and Method Blank were performing correctly, numerous uncharacteristically high results were noted. This value has been excluded from summary statistics.

Stowe Mountain Resort
Monitoring Station Baseflow Chemistry
Station: WBRM7.5 (MS-8)
Upper West Branch, above Big Spruce

DATE		ALK mg/L	pH s.u.	Chloride mg/L		NO3 mg/L		TKN mg/L		TP mg/L		TDP mg/L		TSS mg/L		Turbidity NTU	Conductivity umho/cm	TEMP DEG C
9/11/2000		10	7.14														59.1	13.6
9/25/2000		4	6.99														33.5	8.0
9/17/2003		15	7.30														84.4	13.4
10/1/2003		17	7.90														74.3	9.3
8/9/2004		6.6	7.28													0.18	44.2	13.8
9/29/2004		10.0	7.44													0.29	56.0	11.7
11/21/2005		4.0	6.41														39.5	5.2
8/31/2006			8.21											<	2	< 0.02	52.8	11.4
10/17/2006			6.81												3	0.17	27.8	6.0
2/7/2007		6.0	7.30	4.04													35.0	0.0
7/25/2007		7.0	6.69	3.7		0.369		0.093	<	0.005	<	0.005					39.1	14.6
9/25/2007		9.6	7.45	5.1		0.24	<	0.05	<	0.005	<	0.005					50.5	14.6
1/17/2008		5.9	7.83	7.1													34.1	0.0
8/27/2008		7.2	6.84	4.2		0.30		0.10	<	0.005	<	0.005					42.8	12.0
10/14/2008		5.2	6.66	4.0		0.18	<	0.10	<	0.005	<	0.005					38.2	11.1
1/13/2009		25.9	6.43	6.7													35.6	0.7
8/28/2009		8.76	6.59	5.5		0.21	<	0.05	<	0.005	<	0.005					43.4	11.6
9/11/2009		9.55	6.81	7.3		0.25		0.06	<	0.005		0.006					50.3	11.2
1/13/2010		6.3	6.95	8.7													41.5	0.2
9/21/2010		6.7	7.41	4.5		0.2		0.11		0.006	<	0.005					37.9	9.8
9/21/2011		6.9	7.79	5.2		0.19	<	0.1		0.007		0.008					41.3	11.6
9/13/2012		9.5	6.05	9.3		0.33		0.1	<	0.005		0.005					64.4	12.5
9/19/2013	<	2	6.99	5.2		0.31		0.22	<	0.005							44.3	10.7
9/22/2014		6.7	7.43	5.2	*	0.2		0.15	# <	0.4							43.7	8.8
2003-2014 SUMMARY																		
	Mean	8.8	6.82	5.72		0.25		0.103	<	0.005	<	0.005		3		0.17	46.4	9.1
	Max	26	8.21	9.30		0.37		0.220	<	0.007	<	0.008		3		0.29	84.4	14.6
	Min	< 2	6.05	3.70		0.18	<	0.050	<	0.005	<	0.005		2	<	0.02	27.8	0.0
	n	20	22	15		11		11		10		9		2		4	22	22

Note: Blank in column indicates sample not analyzed

* = The data set initial low level Line Check analysis at 0.050 mg/L was 78% of the expected target. Closing line check at 0.020 mg/L was 95% of the expected target. Some negative bias may be present.
# = Reporting limit increased. The laboratory has determined the Phosphorous testing protocol during the time period these samples were tested was subject to a random high-bias due to a non-phosphorous contaminant. Although QA elements such as the Lab Control Standard and Method Blank were performing correctly, numerous uncharacteristically high results were noted. This vlaue has been excluded from summary statistics.

Stowe Mountain Resort
Monitoring Station Baseflow Chemistry
Station: WBRM6.5 (MS-14)
Lower West Branch, above Pinnacle Brook

DATE		ALK mg/L		pH s.u.		Chloride mg/L		NO3 mg/L		TKN mg/L		TP mg/L		TDP mg/L		TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
9/11/2000		12.0		7.50		5.60		0.336		0.096		0.011	<	0.002				69.5	13.6
9/25/2000		7.2		7.74	<	4.00		0.196	<	0.040	<	0.002	<	0.002				42.5	9.5
9/17/2003		16.0		7.42		11.6		0.429		0.044		0.006		0.002				98.1	14.3
10/1/2003		12.0		8.04		6.72		0.271		0.143		0.009		0.004				68.1	9.0
8/9/2004		8.2		7.52		4.51		0.275		0.094	<	0.005	<	0.005			0.60	56.6	14.3
9/29/2004		12.0		7.42		6.93		0.286		0.080	<	0.005	<	0.005			0.25	80.0	11.5
8/24/2005		16		6.90		7.94		0.335		0.076	<	0.005	<	0.005				70.6	13.7
11/21/2005		8.8		6.69		4.69		0.337		0.074	<	0.005	<	0.005				59.0	4.5
8/31/2006				7.51		8.33		0.257	<	0.040	<	0.005	<	0.005		3	0.34	84.4	10.7
10/17/2006				6.68		5.13		0.249		0.059	<	0.005	<	0.005	<	2	0.29	43.1	6.3
2/7/2007		12		7.80		9.47												89.0	0.1
7/25/2007		10		6.77		8.84		0.356	<	0.050	<	0.005	<	0.005				63.1	14.8
9/25/2007		18.8		7.41		10		0.24	<	0.050	<	0.005	<	0.005				75.0	14.6
1/17/2008		9.7		7.36		18												59	0.0
8/27/2008		11.6		7.00		12		0.30		0.19	<	0.005		0.006				69.6	12.5
10/14/2008		12.4		6.92		12		0.16	<	0.10	<	0.005		0.005				65.0	11.1
1/13/2009		11.1		6.48		16												38.0	0.0
8/28/2009		15.9		6.41		15		0.22	<	0.05		0.011		0.007				81.4	12.0
9/11/2009		17.1		6.99		18		0.26	<	0.05		0.005	<	0.005				97.3	12.7
1/13/2010		11.1		7.14		12												53.2	0.1
9/21/2010		12		7.30		11		0.21	<	0.10	<	0.005	<	0.005				68.0	10.2
9/21/2011		13		7.82		15		0.19	<	0.1		0.005	<	0.005				78.6	12.4
9/13/2012		13		6.47		16		0.29		0.2	<	0.005		0.005				91.5	12.3
9/19/2013	<	2		7.29		16		0.29		0.2	<	0.005						86.1	11.3
9/22/2014		9.6		7.43		18	*	0.22		0.3	# <	0.4						92.6	9.5
2003-2014 SUMMARY																			
	Mean	12.0		6.95		11.4		0.272		0.102		0.006		0.005		3	0.37	72.5	9.5
	Max	18.8		8.04		18.0		0.429		0.280		0.011		0.007		3	0.60	98.1	14.8
	Min	< 2.0		6.41		4.51		0.160	<	0.040	<	0.005	<	0.002	<	2	0.25	38.0	0.0
	n	21		23		23		19		19		18		17		2	4	23	23

Note: Blank in column indicates sample not analyzed

* = The data set initial low level Line Check analysis at 0.050 mg/L was 78% of the expected target. Closing line check at 0.020 mg/L was 95% of the expected target. Some negative bias may be present.
# = Reporting limit increased. The laboratory has determined the Phosphorous testing protocol during the time period these samples were tested was subject to a random high-bias due to a non-phosphorous contaminant. Although QA elements such as the Lab Control Standard and Method Blank were performing correctly, numerous uncharacteristically high results were noted. This value has been excluded from summary statistics.

Stowe Mountain Resort
Monitoring Station Baseflow Chemistry
Station: BSRM0.9 (MS-9)
Upper Big Spruce, above Limits of Golf Course and below Ski Trails

DATE		ALK mg/L	pH s.u.		Chloride mg/L	NO3 mg/L		TKN mg/L		TP mg/L		TDP mg/L		TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
9/11/2000		5.1	6.90													32.6	14.3
9/25/2000		8.1	6.42													47.7	10.5
8/24/2005			6.73	<	2.50	0.220		0.065								91.9	13.7
11/21/2005			6.61	<	2.50	0.393		0.057	<	0.005	<	0.005				41.7	4.5
3/13/2006			4.82	<	2.50	1.24		0.281		0.006	<*	0.005				57.0	1.2
6/19/2006			6.35	<	2.50	0.117		0.079		0.008	<	0.005				39.7	17.2
8/31/2006			8.02	<	2.50	0.138		0.120	<	0.005	<	0.005	<	2	0.02	45.8	12.2
9/18/2006			7.05	<	2.50	0.112	<	0.050	<	0.005	<	0.005				51.1	16.6
10/172006			6.68	<	2.50	0.175		0.126	<	0.005	<	0.005	<	2	0.31	28.2	6.4
11/30/2006			7.13	<	2.50	0.380			<	0.005		0.005				42.2	7.3
7/25/2007		3.7	6.71	<	2.50	0.142	<	0.050	<	0.005	<	0.005				31.9	14.9
9/25/2007		4.0	7.35	<	2.50	0.070		0.060	<	0.005	<	0.005				39.7	14.4
8/27/2008		6.0	6.38	<	2.50	0.20		0.15		0.005	<	0.005				32.0	12.5
10/14/2008		3.6	6.42	<	2.50	0.03	<	0.10	<	0.005	<	0.005				30.7	10.6
8/28/2009		3.18	7.25	<	2.50	0.06		0.06	<	0.005	<	0.005				29.4	11.4
9/11/2009		5.57	7.40	<	2.50	0.15		0.07		0.005	<	0.005				38.2	13.3
9/21/2010		2.30	7.77	<	2.50	0.06		0.14		0.007	<	0.005				26.4	9.6
2005-2010 SUMMARY																	
	Mean	4.0	5.93	<	2.50	0.23		0.101		0.005	<	0.005	<	2	0.17	41.7	11.1
	Max	6.0	8.02	<	2.50	1.24		0.281	<	0.008	<	0.005	<	2	0.31	91.9	17.2
	Min	2.3	4.82	<	2.50	0.03	<	0.050	<	0.005	<	0.005	<	2	0.02	26.4	1.2
	n	7	15		15	15		14		14		14		2	2	15	15

Note: Blank in column indicates sample not analyzed
"*" indicates sample was not preserved as necessary as specified in the reference method.

Stowe Mountain Resort
Monitoring Station Baseflow Chemistry
Station: BSRM0.3 (MS-10A)
Middle Big Spruce, above Little Spruce

DATE		ALK mg/L	pH s.u.	Chloride mg/L		NO3 mg/L		TKN mg/L		TP mg/L		TDP mg/L		TSS mg/L	Turbidity NTU	Cond. umho/cm	Total Iron mg/L	TEMP DEG C
8/31/2006			7.48	5.30		0.219		0.095	<	0.005		0.007	<	2	6.89	89.7		12.2
10/17/2006			6.76	5.07		0.223		0.151	<	0.005	<	0.005	<	2	0.91	55.2		6.2
2/7/2007		15	7.10	13.9												6.1		0.1
7/25/2007		14	6.55	12.8		0.285		0.094	<	0.005	<	0.005				100.9		17.7
9/25/2007		19.2	7.22	26		0.28	<	0.05	<	0.005	<	0.005				140.4		14.4
1/17/2008		9.7	7.12	21												70.9		0.0
8/27/2008		15.6	7.05	40		0.30		0.14		0.006	<	0.005				165.7		13.1
10/14/2008		16	6.77	35		0.15		5.4		0.012		0.008				151.9		11.0
1/13/2009		12.7	6.70	28												89.4		1.2
8/28/2009		16	6.30	29		0.19	<	0.05	<	0.005	<	0.005				134.5		12.3
9/11/2009		19.1	6.94	61		0.42		0.08	<	0.005		0.005				222.8		12.4
1/13/2010		8.3	7.17	69												155.3		0.1
9/21/2010		14	7.50	32		0.16	<	0.1	<	0.005	<	0.005				128.7	0.071	10.4
9/21/2011		19	7.58	30		0.19		0.13		0.005	<	0.005				130.3	0.054	12.0
9/13/2012		30	6.56	70		0.28		0.15	<	0.005		0.005				257	0.054	12.8
9/19/2013	<	2	7.18	25		0.19		0.3	<	0.005						114.2	0.17	9.6
9/22/2014		26	7.22	34	*	0.21		0.14	# <	0.4						148.2	0.21	8.7
2006-2014 SUMMARY																		
	Mean	16	6.87	32		0.238		0.53		0.006		0.005	<	2	3.90	127.1	0.112	9.1
	Max	30	7.58	70		0.420		5.4		0.012		0.008	<	2	6.89	257.0	0.210	17.7
	Min	< 2	6.30	5.07		0.150	<	0.05	<	0.005	<	0.005	<	2	0.91	6.1	0.054	0.0
	n	15	17	17		13		13		12		11		2	2	17	5	17

Note: Blank in column indicates sample not analyzed

* = The data set initial low level Line Check analysis at 0.050 mg/L was 78% of the expected target. Closing line check at 0.020 mg/L was 95% of the expected target. Some negative bias may be present.
# = Reporting limit increased. The laboratory has determined the Phosphorous testing protocol during the time period these samples were tested was subject to a random high-bias due to a non-phosphorous contaminant. Although QA elements such as the Lab Control Standard and Method Blank were performing correctly, numerous uncharacteristically high results were noted. This value has been excluded from summary statistics.

Stowe Mountain Resort
Monitoring Station Baseflow Chemistry
Station: LS.01
Little Spruce Brook just US of confluence with Big Spruce

DATE		Alkalinity mg/L	pH s.u.		Chloride mg/L		NO3 mg/L		TKN mg/L		TP mg/L	Cond. umho/cm	TEMP DEG C
9/19/2013		6.8	7.86		91.00		0.3		0.26		0.067	355.7	10.4
9/22/2014		6.7	7.43		5.20	*	0.2		0.15	# <	0.400	43.7	8.8
2013-2014 SUMMARY													
	Mean	6.8	7.59	<	48.10		0.250		0.205		0.067	199.7	9.6
	Max	6.8	7.86	<	91.00		0.300		0.260		0.067	355.7	10.4
	Min	6.7	7.43	<	5.20	<	0.200	<	0.150	<	0.067	43.7	8.8
	n	2	2		2		2		2		1	2	2

Note: Blank in column indicates sample not analyzed

* = The data set initial low level Line Check analysis at 0.050 mg/L was 78% of the expected target. Closing line check at 0.020 mg/L was 95% of the expected target. Some negative bias may be present.
# = Reporting limit increased. The laboratory has determined the Phosphorous testing protocol during the time period these samples were tested was subject to a random high-bias due to a non-phosphorous contaminant. Although QA elements such as the Lab Control Standard and Method Blank were performing correctly, numerous uncharacteristically high results were noted. This value has been excluded from summary statistics.

Stowe Mountain Resort
Monitoring Station Baseflow Chemistry
Station: BSRM0.2 (MS-10)
Lower Big Spruce, above West Branch

DATE	ALK mg/L	pH s.u.	Chloride mg/L	NO3 mg/L	TKN mg/L	TP mg/L	TDP mg/L	TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
9/11/2000	16.0	7.34	9.27	0.323	0.248	0.018	< 0.002			92.3	14.6
9/25/2000	10.0	7.50	< 4.00	0.110	0.058	< 0.002	< 0.002			47.7	10.5
9/17/2003	19.0	7.20	9.53	0.389	< 0.040	0.004	< 0.002			108	15.5
10/1/2003	18.0	7.81	5.04	0.164	0.079	0.006	< 0.002			72.5	9.6
8/9/2004	18.0	7.45	5.03	0.566	0.317	< 0.005	< 0.005		1.26	85.0	15.3
9/29/2004	25.0	7.29	10.5	0.451	0.121	< 0.005	< 0.005		0.50	122.3	10.8
8/24/2005	24	6.51	9.69	0.455	0.068	< 0.005	< 0.005			91.3	13.2
11/21/2005	13	6.49	3.84	0.446	0.089	< 0.005	< 0.005			81.0	4.7
8/31/2006		7.58	28.2	0.286	0.071	0.005	0.006	< 2	1.73	183.1	12.0
10/17/2006		6.93	14.5	0.247	0.074	< 0.005	< 0.005	< 2	0.62	85.9	6.3
2/7/2207	21	7.10	26							9.5	0.7
7/25/2007	22	6.79	37.6	0.341	< 0.050	< 0.005	< 0.005			192.6	17.3
9/25/2007	32	7.27	60	0.34	0.060	< 0.005	< 0.005			250.9	14.9
1/17/2008	11	7.18	28							85.9	0
8/27/2008	2.8	6.70	< 2.5	0.10	0.15	0.005	< 0.005			305.1	13.1
10/14/2008	20.3	6.86	54	0.17	2.3	0.007	0.006			198.7	11.2
1/13/2009	13.9	7.13	34							103.5	1.0
8/28/2009	8.4	6.23	46	0.21	< 0.05	< 0.005	< 0.005			191.4	12.2
9/11/2009	17.5	7.04	100	0.42	0.06	< 0.005	< 0.005			338.7	11.7
1/13/2010	16.1	7.32	53							147.3	0.5
9/21/2010	21	7.41	57	0.23	0.11	0.010	0.011			201.6	10.2
9/21/2011	20	7.66	59	0.25	0.13	0.005	< 0.005			210	11.9
9/13/2012	36	6.75	88	0.3	0.12	< 0.005	0.005			314.6	12.6
9/19/2013	2.1	7.45	39	0.21	0.28	< 0.005				168.4	9.8
9/22/2014	35	7.59	52 *	0.23	0.14	# < 0.4				210.5	8.5
2003-2014 SUMMARY											
Mean	18.9	6.92	35.8	0.306	0.227	0.005	0.005	< 2	1.03	163.4	9.7
Max	36.0	7.81	100.0	0.566	2.300	0.010	0.011	< 2	1.73	338.7	17.3
Min	2.1	6.23	< 2.5	0.100	< 0.040	0.004	< 0.002	< 2	0.50	9.5	0
n	23	23	23	19	19	18	17	2	4	23	23

Note: Blank in column indicates sample not analyzed

* = The data set initial low level Line Check analysis at 0.050 mg/L was 78% of the expected target. Closing line check at 0.020 mg/L was 95% of the expected target. Some negative bias may be present.
# = Reporting limit increased. The laboratory has determined the Phosphorous testing protocol during the time period these samples were tested was subject to a random high-bias due to a non-phosphorous contaminant. Although QA elements such as the Lab Control Standard and Method Blank were performing correctly, numerous uncharacteristically high results were noted. This value has been excluded from summary statistics.

Stowe Mountain Resort
Monitoring Station Baseflow Chemistry
Station: PBRM0.6 (MS-12)
Upper Pinnacle Brook, above limits of Golf Course

DATE		Alkalinity mg/L	pH s.u.		Chloride mg/L		NO3 mg/L		TKN mg/L		TP mg/L		TDP mg/L	TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
8/24/2005			6.30	<	2.50		0.233		0.116							30.1	14.6
11/21/2005			5.80	<	2.50	<	0.020	<	0.040	<	0.005	<	0.005			16.2	5.4
3/13/2006			5.00	<	2.50		0.742		0.106	<	0.005	<	0.005			21.1	1.2
8/31/2006			7.83	<	2.50		0.047		0.056	<	0.005		0.006	4	0.02	17.8	11.4
9/18/2006			7.22	<	2.50		0.020	<	0.080	<	0.005	<	0.005			19.1	16.2
10/17/2006			5.88	<	2.50		0.050		0.111		0.005		0.005	3	0.43	11.2	5.9
11/30/2006			7.61	<	2.50		0.415			<	0.005	<	0.005			41.0	6.8
7/25/2007		2.5	6.93	<	2.50		0.083		0.097	<	0.005	<	0.005			15.0	16.0
9/25/2007		2.4	7.40	<	2.50		0.050	<	0.050	<	0.005	<	0.005			21.9	13.7
8/27/2008	<	2.0	6.65	<	2.50		0.10		0.17	<	0.005	<	0.005			14.8	13.1
10/14/2008	<	2.0	6.56	<	2.50	<	0.02	<	0.10	<	0.005		0.007			13.7	10.3
8/28/2009	<	2.0	7.03	<	2.50		0.05		0.19	<	0.005	<	0.005			130	11.2
2005-2010 SUMMARY																	
	Mean	2.2	5.93	<	2.50		0.153		0.101		0.005		0.005	4	0.23	29.3	10.5
	Max	2.5	7.83	<	2.50		0.742		0.190		0.005		0.007	4	0.43	130.0	16.2
	Min	2.0	5.00	<	2.50	<	0.020	<	0.040	<	0.005	<	0.005	3	0.02	11.2	1.2
	n	5	12		12		12		11		11		11	2	2	12	12

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Baseflow Chemistry
Station: PBRM0.1 (MS-13)
Lower Pinnacle Brook, above confluence with West Branch

DATE		ALK mg/L	pH s.u.		Chloride mg/L		NO3 mg/L		TKN mg/L		TP mg/L		TDP mg/L		TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
9/11/2000		4.7	6.98														28.0	14.2
9/25/2000		2.1	7.30														19.2	8.0
9/17/2003		6.0	6.92														32.9	14.4
10/1/2003		4.3	7.80														21.7	9.0
8/9/2004		2.5	7.53													0.14	21.7	13.7
9/29/2004		5.3	7.50													0.10	29.9	11.8
8/24/2005		3.7	6.71	<	2.50		0.268		0.095	<	0.005	<	0.005				27.0	14.4
11/21/2005		2.0	6.68	<	2.50	<	0.020		0.076	<	0.005	<	0.005				18.0	4.0
8/31/2006			7.74	<	2.50		0.069	<	0.040		0.008	<	0.005	<	2	0.02	22.7	11.1
10/17/2006			6.15	<	2.50		0.044		0.036	<	0.005	<	0.005	<	2	0.42	13.6	6.2
2/7/2007		2.0	7.31	<	2.50												15.3	0.3
7/25/2007		1.2	6.48	<	2.50		0.113		0.174		0.007	<	0.005				18.2	15.5
9/25/2007		4.4	7.14	<	2.50		0.06		0.06	<	0.005	<	0.005				25.2	14.7
1/17/2008	<	2.0	6.62	<	2.50												12.4	0.1
8/27/2008		18.8	7.30		87		0.4		0.15	<	0.005	<	0.005				19.1	12.8
10/14/2008		3.2	5.99	<	2.50	<	0.02	<	0.10	<	0.005		0.005				18.5	11.1
1/13/2009		4.4	6.83	<	2.50												14.0	0.7
8/28/2009	<	2.0	6.58	<	2.50		0.07	<	0.05		0.013		0.008				17.4	11.9
9/11/2009		4.78	7.35	<	2.50		0.18		0.09	<	0.005	<	0.005				23.1	12.5
1/13/2010		2.7	7.40	<	2.50												16.4	
9/21/2010	<	2.0	7.69	<	2.50		0.04		0.11	<	0.005	<	0.005				17.9	9.9
9/21/2011		3.0	7.58	<	2.50		0.046	<	0.1		0.005		0.005				16.3	11.7
9/13/2012		4.4	6.81	<	2.50		0.15		0.21	<	0.005		0.005				27	12.8
9/19/2013	<	2.0	6.5	<	2.50		0.08		0.24	<	0.005						18.9	10.6
9/22/2014		2.5	7.01	<	2.50	*	0.082		0.11	# <	0.4						23.2	9.3
2003-2014 SUMMARY																		
	Mean	4.0	6.74		6.9		0.109		0.109		0.006	<	0.005			0.17	20.5	9.9
	Max	18.8	7.80		87		0.4		0.240		0.013		0.008			0.42	32.9	15.5
	Min	1.2	5.99	<	2.50	<	0.02		0.036	<	0.005	<	0.005			0.02	12.4	0.1
	n	21	23		19		15		15		14		13			4	23	22

Note: Blank in column indicates sample not analyzed

* = The data set initial low level Line Check analysis at 0.050 mg/L was 78% of the expected target. Closing line check at 0.020 mg/L was 95% of the expected target. Some negative bias may be present.
# = Reporting limit increased. The laboratory has determined the Phosphorous testing protocol during the time period these samples were tested was subject to a random high-bias due to a non-phosphorous contaminant. Although QA elements such as the Lab Control Standard and Method Blank were performing correctly, numerous uncharacteristically high results were noted. This value has been excluded from summary statistics.

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: WBRM8.2
West Branch above Barnes Camp

DATE	Event Inches of rain	pH s.u.	Alk. mg/L		Chloride mg/L	TSS mg/L		Turbidity NTU	Cond. umho/cm	TEMP DEG C
10/15/2010	2.94"			<	2.5	28		2.08		7.8
4/11/2011	thaw with 0.96"			<	2.5	110		15.0	13.3	0.8
6/23/2011	1"			<	2.5	10		3.32	23.5	11.0
11/30/2011	thaw with 0.35"	7.25	2.8	<	2.5	3		0.56	18.4	7.4
3/12/2012	thaw	8.32	3.9	<	2.5	2	<	0.50	23.6	6.7
3/21/2012	thaw			<	2.5	6		1.96	18.7	7.3
5/8/2012	0.6" -1.2"	7.55		<	2.5	4		1.57	22.2	7.3
6/27/2012	2.33"	6.41		<	2.5	6		1.62	15	11.1
9/5/2012	2.15"	6.36		<	2.5	6		1.13	19.2	13.8
1/14/2013	thaw	8.34		<	2.5			1.11	14.1	2.6
1/31/2013	thaw with 1.69"	6.79		<	2.5			2.22	13.2	0.3
5/23/2013	2.96"	6.83						105	15.6	11.1
6/11/2013	1.56"	5.69						5.48	12.5	9.2
10/31/2013	0.6"	6.73						3.13	22.2	4.9
11/1/2013	1.25"	6.48						0.91	19.7	8.8
4/14/2014	thaw			<	2.5			10.8	15	2.2
4/15/2014	thaw with 1.21"	6.09						86.8	12.3	0.3
6/25/2015	1.59"	6.63						0.95	23.7	11.9
10/16/2014	0.88"	6.44						1.14	24.7	11.5
11/24/2014	thaw with 0.49"	6.69						1.75	23.9	2.6
4/17/2015	thaw with 0.48"	6.4		<	2.5			1.42	23.2	2.8
2010-2015 SUMMARY										
Mean		6.44	3.35	<	2.5	19.4		11.8	18.7	6.7
Max		8.34	3.90	<	2.5	110		105.0	24.7	13.8
n		16	2		13	9		21	20	21

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: WBRM8.0 (MS-16B)
West Branch above Mansfield Basin

DATE	Event Inches of rain	pH s.u.		Alk. mg/L		Chloride mg/L	TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
9/29/2006	1.79" over 21 hrs	6.01			<	2.50	15	3.1	14.8	10.2
10/20/2006	1.00	6.17			<	2.50	33	9.6	11.7	6.8
3/15/2007	thaw w/ 1" of rain	5.71					26	20.3	29.3	0.0
4/20/2007	thaw w/no rain	6.86					27	17.0	31.9	6.6
8/6/2007	1.36"	7.25			<	2.50	11	10.8	29	14
11/6/2007	1.2"	6.60			<	2.50	3	4.22	17.9	4.6
4/1/2008	thaw w/ 0.07" rain	6.67					30	8.02	28.6	0.4
4/16/2008	thaw w/ no rain	6.69					3	2.93	34.9	4.0
10/2/2008	2 events 0.9"/0.7"	7.05			<	2.50	2	1.06	16.5	9.5
3/11/2009	thaw w/ 0.53" rain	7.59					2	6.0	37.6	1.2
3/29/2009	thaw w/ 0.24" rain	6.45					17	2.92	20.8	1.6
5/29/2009	1.18"	7.75	<	2.0			2	1.2	12.1	6.6
7/31/2009	0.57"	7.02			<	2.5	2	1.80	25.3	13.9
10/7/2009	0.93"	8.6	<	2.0		2.5	10	1.34	12.5	8.5
11/20/2009	1.05"	6.41	<	2.0			6	1.85	19.9	
3/23/2010	thaw w/ 1.78" rain	6.2	<	2.0			26	9.65	14.0	0.6
9/30/2010	0.65"	5.64		2.4	<	2.5	11	1.52	18.5	13.2
10/1/2010	3.70"	5.88		21.0	<	2.5	340	80.9	11.9	12.3
10/15/2010	2.94"	7.71		2.1	<	2.5	86	49.2		7.4
4/11/2011	thaw with 0.96"	6.44	<	2.0	<	2.5	180	42.1	15.7	0.4
4/25/2011	thaw w/0.12" rain	7.41		2.7	<	2.5	16	5.2	17.7	4.3
6/23/2011	1"	6.04		3.8	<	2.5	68	18.4	24.3	12.9
11/30/2011	thaw with 0.35"	6.20		2.5	<	2.5	4	1.22	23.7	7.0
3/12/2012	thaw	8.99		4.8		6.9	2	1.38	36.0	5.3
3/21/2012	thaw	6.69	<	2.0	<	2.5	14	2.36	16.6	5.6
5/8/2012	0.6" -1.2"	6.58			<	2.5	9	2.65	14.8	6.9
6/27/2012	2.33"	5.58			<	2.5	22	3.95	10.0	11.3
9/5/2012	2.15"	5.44			<	2.5	8	1.36	15.7	14.3
1/14/2013	thaw	7.23				3.5		0.84	18.9	1.5
1/31/2013	thaw with 1.69"	4.37				2.9		0.5	16.3	-0.2
5/23/2013	2.96"	5.9						56	13.7	10.2
6/11/2013	1.56"	6.4						6.68	13.2	9.5
10/31/2013	0.6"	6.76						3.01	18.4	4.1
11/1/2013	1.25"	6.12						2.4	17.2	8.4
4/14/2014	thaw				<	2.5		36.2	17.2	0.4
4/15/2014	thaw with 1.21"	5.58						71.5	14.0	0.3
6/25/2015	1.59"	6.43						2.88	22.8	12.4
10/16/2014	0.88"	6.19						1.5	20.8	12.2
11/24/2014	thaw with 0.49"	6.36						5.31	19.8	0.4
4/17/2015	thaw with 0.48"	6.44				3.9		3.12	32.8	1.9
2006-2015 SUMMARY										
Mean		5.76		3.9		2.8	35	12.5	20.2	6.4
Max		8.99		21.0		6.9	340	80.9	37.6	14.3
n		39		13		23	28	40	39	39

Note: Blank in column indicates sample not analyzed
* = Laboratory Duplicate analysis of this sample was not within method acceptance limts. The value of the Laboratory Duplicate was significantly lower than reported value.

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: WBRM7.5 (MS-8)
Upper West Branch, above Big Spruce

DATE	Event Inches of rain	pH s.u.	Alk. mg/L	Chloride	TSS mg/L	Turbidity NTU	Conductivity umho/cm	TEMP DEG C
8/23/2000	1.00				2	1.4	41.2	13.5
9/4/2000	0.30				2	0.5	43.3	12.5
10/6/2000	0.95				5	1.7	31.1	8.5
4/22/2001	0.25	7.80			36	1.9	36.0	1.6
10/4/2003	0.50				99	9.9	52.6	7.2
10/15/2003	1.31				8	3.5	29.4	9.4
3/25/2004	0.50				55	40.0	167	1.0
8/12/2004	0.78				168	8.8	50.4	14.0
12/1/2004		7.20			5	3.1	115.5	2.1
4/23/2005	0.86	6.59			2	0.32	29.8	4.0
8/31/2005	2.54	5.61			8	1.07	19.1	16.3
9/27/2005	1.88	6.43			2	0.55	18.2	10.9
1/12/2006	thaw w/ rain	6.54			2	1.36	50.7	1.7
5/19/2006	2.75"over 40 hrs.	6.78			19	41.5		
9/29/2006	1.79" over 21 hrs	8.51			12	4.48	18.1	10.3
10/20/2006	1.00	6.44			20	11.5	15.5	7.0
3/15/2007	thaw w/ 1" of rain	6.12			30	17.9	37.4	0.1
4/20/2007	thaw w/no rain	6.90			29	28.3	39.3	6.7
8/6/2007	1.36"	7.04			19	33.5	34.9	14.3
11/6/2007	1.32"	6.89			14	14.9	27.3	5
4/1/2008	thaw w/ 0.07" rain	6.93			58	20.0	61.3	1.1
4/16/2008	thaw w/ no rain	6.39			3	3.53	48.2	5.7
10/2/2008	2 events 0.9"/0.7"	6.94		< 2.5	3	1.43	22.2	9.7
3/11/2009	thaw w/ 0.53" rain	7.45			28	82	134.1	1.2
3/29/2009	thaw w/ 0.24" rain	6.51			26	7.22	30.8	2.0
5/29/2009	1.18"	7.92	< 2.0		4	1.2	17.4	6.9
7/31/2009	0.57"	7.13		3.8	< 2	1.55	38.4	14.0
10/7/2009	0.93"	7.74	< 2.0	< 2.5	11	3.18	17.5	8.7
11/20/2009	1.05"	6.44	2.4		9	5.04	28.7	
3/19/2010	thaw w/ no rain	7.27			10	6.58	39.8	4.8
3/23/2010	thaw w/ 1.78" rain	6.29	< 2.0		54	21.7	20.5	1.0
9/30/2010	0.65"	6.15	3.8	2.6	10	1.57	27.5	13.0
10/1/2010	3.70"	6.44	2.0	< 2.5	466	130	16.4	12.3
10/15/2010	2.94"	7.28	3.7	3.1	34	8.07		7.7
4/11/2011	thaw with 0.96"	6.15	< 2.0	6.0	160	38.0	24.8	0.5
4/25/2011	thaw w/0.12" rain	7.07	3.2	3.2	15	4.4	23.7	4.6

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: WBRM7.5 (MS-8)
Upper West Branch, above Big Spruce

DATE	Event Inches of rain	pH s.u.	Alk. mg/L	Chloride	TSS mg/L	Turbidity NTU	Conductivity umho/cm	TEMP DEG C
6/23/2011	1"	6.23	4.5	3.3	24	13.3	28.6	12.7
11/30/2011	thaw with 0.35"	6.41	2.0	< 2.5	6	1.73	21.3	7.2
3/12/2012	thaw	8.73	6.4	22	4	4.68	71.7	5.8
3/21/2012	thaw	6.56	< 2.0	3.4	12	2.51	22.0	6.7
5/8/2012	0.6" -1.2"	6.48	2.7	< 2.5	11	4.20	24.4	7.2
6/27/2012	2.33"	6.1		< 2.5	18	2.87	17.3	11.4
9/5/2012	2.15"	6.33		< 2.5	7	2.18	22.5	14.4
1/14/2013	thaw	6.58		9.1		1.38	32.8	2.2
1/31/2013	thaw with 1.69"	6.9		9.7		3.39	31.5	-0.3
5/23/2013	2.96"	6.4				181	15.7	11.6
6/11/2013	1.56"	6.42				16.20	18.2	9.5
10/31/2013	0.6"	6.55				3.57	24.5	4.5
11/1/2013	1.25"	6.62				1.23	23.9	8.5
4/12/2014	thaw	6.88				1.80	40.7	2.7
4/14/2014	thaw			2.9		39.90	19.3	1.0
4/15/2014	thaw with 1.21"	5.92				55.00	15.5	0.5
6/25/2014	1.59"	6.43				2.26	67.2	17.9
10/16/2014	0.88"	6.64				1.25	27.2	12.0
11/24/2014	thaw with 0.49"	6.75				7.11	28.4	1.4
4/17/2015	thaw with 0.48"	6.77		6.7		5.63	46.5	2.3
2003-2015 SUMMARY								
Mean		6.47	2.9	4.9	38	17.4	37.1	6.8
Max		8.73	6.4	22.0	466	181.0	167	17.9
n		47	14	19	39	52	50	50

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: WBRM6.5 (MS-14)
Lower West Branch, above Pinnacle Brook

DATE		Event Inches of rain	pH s.u.		Alk. mg/L		Chloride mg/L	NO3 mg/L	TKN mg/L		TP mg/L		TDP mg/L		TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
8/23/2000		1.00	6.93				4.00	0.098	0.102		0.009	<	0.002		4	2.1	43.4	13.5
9/4/2000		0.30	8.00				3.98	0.273	0.124		0.008	<	0.002	<	2	0.6	51.5	13.0
10/6/2000		0.95													16	3.0	42.5	8.0
10/4/2003		0.50	7.62				6.13	0.253	0.380		0.084	<	0.002		50	18.8	64.4	7.4
10/15/2003		1.31	6.55				3.19	0.126	0.295		0.023		0.012		6	5.6	35.8	9.7
8/12/2004		0.78	7.42		6.6		5.6	0.237	0.515		0.079	<	0.005		2	32.5	65.4	14.7
12/1/2004			8.10		8.0		10.9	0.320	0.080		0.007	<	0.005	<	2	1.1	73.1	1.8
4/23/2005		0.86	6.45												2	0.8	29.8	4.1
8/31/2005		2.54	5.68			<	2.50	0.479	0.495		0.052	<	0.005		28	24.3	38.7	16.6
9/27/2005		1.88	6.39			<	2.50	0.276	0.139	<	0.005	<	0.005		3	3.32	29.6	11.4
1/12/2006		thaw w/ rain	6.76												4	2.96	53.3	1.4
5/19/2006		2.75"over 40 hrs.	6.71												60	50.7		
9/29/2006		1.79" over 21 hrs	5.80			<	2.50	0.227	0.464		0.048	<	0.005		11	14.6	29.4	10.4
10/20/2006		1.00	6.69			<	2.50	0.182	0.138		0.046		0.006		14	22.4	25.9	8.0
3/15/2007		thaw w/ 1" of rain	5.45												14	11.0	39.7	0.0
4/20/2007		thaw w/no rain	6.60												15	23.0	58.1	6.4
8/6/2007		1.36"	7.13				10.0	0.345	0.667		0.075		0.007		17	42.2	65.1	14.5
11/6/2007		1.32"	7.21				5.9	0.260	0.200		0.031	<	0.005		13	11.5	41.4	5.3
4/1/2008	*	thaw w/ 0.07" rain	6.96												58	35.2	92.5	0.1
4/16/2008		thaw w/ no rain	6.69												7	4.33	72.5	6.6
10/2/2008		2 events 0.9"/0.7"	6.76				4.0	0.080	0.210		0.021	<	0.005		9	1.95	34.3	10.0
3/11/2009		thaw w/ 0.53" rain	7.38												11	19	175.0	1.2
3/29/2009		thaw w/ 0.24" rain	6.95												25	7.84	47.3	2.1
5/29/2009		1.18"	6.03		4.38										4	1.2	28.9	7.4
7/31/2009		0.57"	7.10				13	0.17	0.10		0.005		0.006		3	1.41	73.9	14.8
10/7/2009		0.93"	6.52		3.78		3.8	0.08	0.24		0.02	<	0.005		11	5.25	43.4	9.2
11/20/2009	*	1.05"	6.1	<	2.0										9	3.73	21.2	
3/23/2010	**	thaw w/ 1.78" rain	6.29	<	2.0										42	19.5	36.3	1.4
9/30/2010		0.65"	6.78		6.7		5.8								11	2.92	44.9	13.4
10/1/2010	**	3.70"	7.51		8.4		4.4								257	101		
10/15/2010	**	2.92"	6.72		12.0		9.6								88	50.2		8.1
4/11/2011	**	thaw with 0.96"					26								93	25.4	84.7	1.4
4/11/2011	*	thaw with 0.96"	5.05	<	2.0		3.0								39	11.4	17.0	0.8
4/25/2011		thaw w/0.12" rain			6.4		11								17	3.0	43.6	4.1
6/23/2011		1"	6.61		9.5		12								32	15.7	64.5	13.4
11/30/2011		thaw with 0.35"	6.41		3.2		3.4								6	2.06	28.2	7.4
3/12/2012		thaw	8.57		11		40								5	4.54	115.1	4.7
5/8/2012	**	0.6" -1.2"	6.80		7.7		12								20	7.55	70.0	8.2
6/27/2012	**	2.33"	6.77				5								19	7.25	33.3	12.1
9/5/2012	**	2.15"	6.84				11								15	7.22	85.6	
1/14/2013	**	thaw	6.31				17									1.75	54.3	2
1/31/2013	**	thaw with 1.69"	6.07				33									8.60	77.5	-0.3
5/23/2013	**&	2.96"	5.83													18	65.1	12.5

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: WBRM6.5 (MS-14)
Lower West Branch, above Pinnacle Brook

DATE		Event Inches of rain	pH s.u.	Alk. mg/L	Chloride mg/L	NO3 mg/L	TKN mg/L	TP mg/L	TDP mg/L	TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
6/11/2013	**	1.56"	6.45								13.60	35.0	10
11/1/2013	**	1.25"	6.92								4.61	44.6	8.5
4/14/2014	**	thaw			13						37.10	45.5	1.1
4/15/2014	**	thaw with 1.21"	6.88								157.00	23.8	1
6/25/2014	**	1.59"	7.11								5.57	52.0	13.1
10/16/2014	**	0.88"	7.17								6.78	115.4	12.3
11/24/2014	**	thaw with 0.49"	7.07								15.20	73.5	1.5
4/17/2015	**	thaw with 0.48"	6.86		8						5.35	53.8	2.2
2003-2015 SUMMARY													
	Mean		6.23	6.24	9.88	0.233	0.302	0.038	0.006	28	18.2	55.6	6.9
	Max		8.57	12.00	40	0.479	0.667	0.084	0.012	257	157.0	175.0	16.6
	n		45	15	29	13	13	13	13	37	48	45	44

Note: Blank in column indicates sample not analyzed
* Sample collected below the confluence with Pinnacle Brook due to inability to access the stream above the confluence.
** Sample collected below snowmaking pond at 6.9 river miles.
& Sample collected at RM6.9, however discharge and stream water did not thoroughly mix. Based on turbidity reading, sample is mostly outlet water.

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: BSRM0.9 (MS-9)
Upper Big Spruce, above Limits of Golf Course and below Ski Trails

DATE	Event Inches of rain	pH s.u.	Alk. mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU	Conductivity umho/cm	TEMP DEG C
10/6/2000	0.95				3	1.20	21.9	8.0
4/22/2001	0.25	7.33			27	1.20	23.0	1.4
10/4/2003	0.50					1.15	27.0	7.3
10/15/2003	1.31					0.84	26.2	9.8
3/25/2004	0.50				38	9.50	30.0	1.0
8/12/2004	0.78				< 2	0.49	306	15.4
12/1/2004		7.40			28	7.97	24.9	1.2
4/23/2005	0.86	4.88			2	0.29	21.7	3.4
8/31/2005	2.54	3.83		< 2.5	8	1.96	102.2	16.3
9/27/2005	1.88	4.37		< 2.50	< 2	1.15	66.3	11.5
1/12/2006	thaw w/ rain	5.28		< 2.50	6	2.75	40.0	0.4
5/19/2006	2.75"over 40 hrs.	6.77			63	63.6		
9/29/2006	1.79" over 21 hrs	6.00		< 2.50	< 2	4.72	40.8	10.4
10/20/2006	1.00	5.09		< 2.50	3	4.66	25.8	8.0
3/15/2007	thaw w/ 1" of rain	5.20			11	2.57	25.7	0.0
4/20/2007	thaw w/no rain	6.58			4	1.67	19.8	4.0
9/6/2007	1.36"	6.93		< 2.50	17	27.5	36.0	14.5
11/6/2007	1.32"	6.40		< 2.50	4	2.31	52.7	5.3
4/1/2008	thaw w/ 0.07" rain	5.18			33	7.51	29.2	0.0
4/16/2008	thaw w/ no rain	5.60			6	1.29	23.4	3.0
10/2/2008	2 events 0.9"/0.7"	4.76		< 2.50	< 2	0.56	50.5	10.0
3/11/2009	thaw w/ 0.53" rain	7.36			2	3.0	27.4	0.9
3/29/2009	thaw w/ 0.24" rain	6.93			14	5.53	32.3	1.2
5/29/2009	1.18"	6.82	< 2.0		3	0.7	18.6	7.1
7/31/2009	0.57"	7.03		< 2.5	11	2.1	31.1	14.9
10/7/2009	0.93"	6.66	< 2.0	< 2.5	5	1.12	37.0	9.2
11/20/2009	1.05"	7.79	< 2.0		35	12.3	34.1	
3/19/2010	thaw w/ no rain	7.08			23	11.5	30.1	2.7
3/23/2010	thaw w/ 1.78" rain	5.82	< 2.0		27	9.55	22.4	0.8
9/30/2010	0.65"			< 2.50	3	0.79	25.8	12.9
10/1/2010	3.70"			< 2.50	14	4.42	21.9	12.6
10/15/2010	2.92"			< 2.50	26	6.21		7.9
4/11/2011	thaw w/0.12" rain			3.0	30	9.34	20.1	0.3

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: BSRM0.9 (MS-9)
Upper Big Spruce, above Limits of Golf Course and below Ski Trails

DATE	Event Inches of rain	pH s.u.	Alk. mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU	Conductivity umho/cm	TEMP DEG C
6/23/2011	1"			< 2.5	39	15.3	23.4	13.6
11/30/2011	thaw with 0.35"			< 2.5	4	1.13	31.6	6.8
3/12/2012	thaw			5.5	11	4.23	33.3	3.5
5/8/2012	0.6" -1.2"	6.55		< 2.5	63	33.3	17.2	6.9
6/27/2012	2.33"	5.29		< 2.5	12	2.19	19.6	11.8
9/5/2012	2.15"	4.7		< 2.5	3	1	27.5	14.4
1/14/2013	thaw	7.3		4.8		1.06	26.1	1.2
1/31/2013	thaw with 1.69"	4.37		4.8		2.05	24.3	-0.4
5/23/2013	2.96"	6.43				27	4.3	11.0
6/11/2013	1.56"	5.62				5.94	16	9.6
11/1/2013	1.25"	5.32				1.15	23.7	7.9
4/14/2014	thaw			< 2.5		14.3	17.5	0.4
4/15/2014	that with 1.21"	5.2				9.15	14.4	0.0
6/25/2014	1.59"	7.11				7.37	67.2	17.9
10/16/2014	0.88"	5.67				0.92	27.9	11.7
11/24/2014	thaw with 0.49"	5.7				6.58	21.4	1.2
4/17/2015	thaw with 0.48"	5.46		3.4		3.77	31.8	1.3
2003-2015 SUMMARY								
Mean		5.02	< 2.0	2.88	16	7.20	36.4	6.8
Max		7.79	< 2.0	5.50	63	63.6	306.0	17.9
n		36	4	24	35	48	46	46

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: BSRM0.7
Upstream of Big Spruce Basin

DATE	Event Inches of rain	pH s.u.		Alk. mg/L		Chloride mg/L	TSS mg/L	Turbidity NTU	Conductivity umho/cm	TEMP DEG C
11/20/2009	1.05"	6.09	<	2.0			43	19.1	34.1	
3/19/2010	thaw w/ no rain	7.4					24	14.8	29.8	3.4
3/23/2010	thaw w/ 1.78" rain	5.82	<	2.0			25	9.95	21.5	1.0
9/30/2010	0.65"				<	2.50	3	1.36	28.3	13.1
10/1/2010	3.70"				<	2.50	24	7.77	20.6	12.8
10/15/2010	2.92"				<	2.50	24	6.12		
4/11/2011	thaw with 0.96"					3.1	25	13.1	20.7	0.3
4/25/2011	thaw w/0.12" rain					3.0	5	2.9	17.9	2.8
6/23/2011	1"				<	2.5	39	20.4	35.7	13.8
11/30/2011	thaw with 0.35"				<	2.5	6	1.98	31.6	7.0
3/12/2012	thaw					8.5	12	6.60	41.8	3.7
5/8/2012	0.6" -1.2"	7.07			<	2.5	110	47.9	22.3	7.4
6/27/2012	2.33"	6.35			<	2.50	10	3.55	23.3	12.1
9/5/2012	2.15"	5.74			<	2.50	4	1.53	28.8	14.5
1/14/2013	thaw	8.33				8.90		3.01	36.1	1.3
1/31/2013	thaw with 1.69"	5.4				6.00		3.35	25	-0.4
5/23/2013	2.96"	6.55						36	11.8	11.7
6/11/2013	1.56"	5.77						7.34	17.4	9.8
11/1/2013	1.25"	6.07						1.77	24.4	8.2
4/14/2014	thaw				<	2.50		16.2	17.9	0.7
4/15/2014	thaw with 1.21"	5.69						10.3	14.5	0.2
6/25/2014	1.59"	6.57						5.02	21.2	15.5
10/16/2014	0.88"	6.43						1.34	29.8	11.8
11/24/2014	thaw with 0.49"	6.28						8.96	23.3	1.4
4/17/2015	thaw with 0.48"	6.04				3.60		3.49	33.7	-0.9
2009-2015 SUMMARY										
Mean		6.01	<	2.0		3.7	25	10.2	25.5	6.6
Max		8.33	<	2.0		8.9	110	47.9	41.8	15.5
n		16		2		15	14	25	24	23

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: BSRM0.3 (MS-10A)
Middle Big Spruce, above Little Spruce

DATE	Event Inches of rain	pH s.u.		Alk. mg/L		Chloride mg/L	NO3 mg/L	TKN mg/L	TP mg/L		TDP mg/L	TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
9/29/2006	1.79" over 21 hrs	6.20			<	2.50	0.351	0.468	0.238	<	0.005	117	78.5	42.5	10.8
10/20/2006	1.00	6.69			<	2.50	0.262	0.431	0.099		0.005	47	47.7	39.0	8.3
3/15/2007	thaw w/ 1" of rain	5.59										55	14.0	33.4	0.0
4/20/2007	thaw w/ no rain	6.83										9	9.7	45.0	4.9
8/6/2007	1.36"	6.93				7.83	0.409	1.18	0.215		0.038	101	111	89.8	15.7
11/6/2007	1.32"	7.21				7.6	0.200	0.330	0.026	<	0.005	8	8.38	88.8	5.3
4/1/2008	thaw w/ 0.07" rain	6.64										29	30.9	51.8	0.0
4/16/2008	thaw w/ no rain	6.49										6	5.64	50.2	4.5
10/2/2008	2 events 0.9"/0.7"	5.74				2.9	0.07	0.75	0.110	<	0.005	66	18.5	36.0	10.2
3/11/2009	thaw w/ 0.53" rain	7.26										5	11	114.1	1.0
3/29/2009	thaw w/ 0.24" rain	6.46										20	9.11	53.7	2.0
5/29/2009	1.18"	5.15		2.39								8	1.6	54.0	7.6
7/31/2009	0.57"	7.07				17	0.17	0.17	0.014		0.005	3	3.31	106.1	15.6
10/7/2009	0.93"	7.45	<	2.0		3.4	0.09	0.28	0.02	<	0.005	17	8.36	35.2	9.4
11/20/2009	1.05"	6.20		2.4		2.4						59	13.1	55.1	
3/19/2010	thaw w/ no rain	7.31										48	16.6	47.8	4.0
3/23/2010	thaw w/ 1.78" rain	6.31	<	2.0								79	39.3	26.6	1.2
9/30/2010	0.65"	6.41		3.5		5.6						13	2.25	48.8	13.5
10/1/2010	3.70"	7.01	<	2.0		2.5						102	45.0	30.5	13.0
10/15/2010	2.92"	6.97		2.6		3.8						120	29.7		8.2
4/11/2011	thaw with 0.96"	5.94	<	2.0		4.6						250	45.0	26.1	0.3
4/25/2011	thaw w/0.12" rain	6.85		3.5		3.9						24	6.6	25.2	3.4
6/23/2011	1"	6.77		15.0		9.7						68	29.3	69.3	14.3
11/30/2011	thaw with 0.35"	6.68		3.1		3.7						7	3.27	49.6	7.3
3/12/2012	thaw	7.27		9.5		24						16	13.0	78.3	3.2
5/8/2012	0.6" -1.2"	7.01		8.7		5.4						79	34.7	45.5	8.3
6/27/2012	2.33"	6.77				14						13	4.6	35.3	12.4
9/5/2012	2.15"	6.77				5.2						9	3.5	46.7	14.8
1/14/2013	thaw	6.33				19							3.4	57.7	1.4
1/31/2013	thaw with 1.69"	6.05				9.5							3.8	36.8	-0.4
5/23/2013	2.96"	5.57											73.0	30.8	12.9
6/11/2013	1.56"	6.37											10.4	27.6	10.3
11/1/2013	1.25"	6.76											2.3	34.9	8.5
4/14/2014	thaw					3.4							26.2	22.7	1.1
4/15/2014	thaw with 1.21"	6.13											18.5	19.1	0.4
6/25/2014	1.59"	6.87											6.3	36.4	15.9
10/16/2014	0.88"	6.73											3.9	51.7	12.2
11/24/2014	thaw with 0.49"	6.64											16.1	36.4	1.5
4/17/2015	thaw with 0.48"	6.54				6.2							7.9	45.9	-0.8
2006-2015 SUMMARY															
Mean		6.19		4.51		7.24	0.222	0.516	0.103		0.010	49	20.9	48.0	6.9
Max		7.45		15.00		24.0	0.409	1.180	0.238		0.038	250	111.0	114.1	15.9
n		38		13		23	7	7	7		7	28	39	38	38

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: BSRM0.2 (MS-10)
Lower Big Spruce, above West Branch

DATE	Event Inches of rain	pH s.u.	Alk. mg/L	Chloride mg/L	NO3 mg/L	TKN mg/L	TP mg/L	TDP mg/L	TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
8/23/2000	1.00	7.11		1.8	0.091	0.103	0.018	0.009	16	6.1	49.4	13.5
9/4/2000	0.30	7.20		5.6	0.225	0.147	0.021	< 0.004	2	0.9	69.1	13.5
10/6/2000	0.95								30	7.3	69.3	9.0
4/22/2001	0.25	7.80							87	5.9	28.0	1.8
10/4/2003	0.50	6.76		4.78	0.123	0.599	0.114	0.007	37	16.4	66.5	7.7
10/15/2003	1.31	6.56		3.48	0.092	0.480	0.046	0.010	17	21.7	49.8	10.3
3/25/2004	0.50								26	27.0	152	1.0
8/12/2004	0.78	8.07	42.2	5.67	0.638	3.95	1.570	0.010	1860	639	118.3	16.4
12/1/2004		7.92	11.0	2.95	0.360	0.183	0.012	< 0.005	< 2	4.1	59.3	1.1
4/23/2005	0.86	6.45							3	1.5	31.6	4.1
8/31/2005	2.54	5.35	<	2.50	1.50	0.719	0.047	0.022	46	33.6	86.4	17
9/27/2005	1.88	6.30	<	2.50	0.868	1.31	0.024	< 0.005	10	12.0	62.4	11.9
1/12/2006	thaw w/ rain	6.60		7.04	0.816	0.268	0.018	< 0.005	9	4.01	42.8	0.5
5/19/2006	2.75"over 40 hrs.	6.85							54	78.1		
9/29/2006	1.79" over 21 hrs	6.11		2.76	0.335	0.766	0.299	< 0.005	181	105.0	46.3	11.1
10/20/2006	1.00	6.67		2.56	0.226	0.663	0.225	< 0.005	94	71.3	35.4	7.6
3/15/2007	thaw w/ 1" of rain	5.46							81	18.1	54.0	0.1
4/20/2007	thaw w/ no rain	6.79							8	5.7	57.0	4.9
8/6/2007	1.36"	7.09		12.8	0.420	1.10	0.211	0.051	62	70.4	107.8	15.8
11/6/2007	1.32"	7.24		9.8	0.190	0.42	0.052	0.009	21	24.6	94.2	5.4
4/1/2008	thaw w/ 0.07" rain	7.03							43	44.1	71.8	0.1
4/16/2008	thaw w/ no rain	6.69							8	6.54	58.7	4.5
10/2/2008	2 events 0.9"/0.7"	5.92		6.7	0.09	0.30	0.012	0.008	< 2	1.97	52.9	10.4
10/2/2008	second sample	6.93							58	9.66	45.9	10.3
3/11/2009	thaw w/ 0.53" rain	7.03							3	8.4	133.7	1.0
3/29/2009	thaw w/ 0.24" rain	6.58							19	9.12	64.8	2.0
5/29/2009	1.18"	5.27	5.17						5	2.4	60.6	7.6
7/31/2009	0.57"	7.12		25	0.18	0.19	0.011	0.006	3	3.52	131.8	15.6
10/7/2009	0.93"	7.44	3.28	4.9	0.09	0.25	0.030	< 0.005	23	10.9	40.6	9.5
11/20/2009	1.05"	6.42	3.6						35	18.8	57.3	
3/19/2010	thaw w/ no rain	7.26							45	19.3	66.5	3.9
3/23/2010	thaw w/ 1.78" rain	6.30	< 2.0						65	29.6	30.9	1.2
9/30/2010	0.65"	6.51	7.1	8.5					10	2.00	61.2	13.6
10/1/2010	3.70"	6.73	2.9	3.1					186	54.5	32.7	13.1
10/15/2010	2.92"	6.83	4.2	4.6					150	40.0		8.2
4/11/2011	thaw with 0.96"	6.06	2.8	7.1					83	18.2	32.7	0.5
4/25/2011	thaw w/0.12" rain	6.82	4.6	6.4					26	5.1	33.6	3.7
6/23/2011	1"	6.95	21.0	15					44	24.0	87.4	14.4
11/30/2011	thaw with 0.35"	6.69	4.0	5.6					7	3.11	59.2	7.4
3/12/2012	thaw	7.42	11	40					13	9.00	115	3.5
3/21/2012	thaw &	6.54	$ 2.1	17					5	2.22	59.0	7.6
5/8/2012	0.6" -1.2"	6.90	10	9.5					64	37.8	57.8	8.7

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: BSRM0.2 (MS-10)
Lower Big Spruce, above West Branch

DATE	Event Inches of rain	pH s.u.	Alk. mg/L	Chloride mg/L	NO3 mg/L	TKN mg/L	TP mg/L	TDP mg/L	TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
6/27/2012	2.33"	6.87		6.1					15	6.4	44.5	12.8
9/5/2012	2.15"	6.59		7.9					8	3.3	58.1	14.5
1/14/2013	thaw	6.37		21						3.8	64.0	1.4
1/31/2013	thaw with 1.69"	6.26		14						5.0	44.4	-0.4
5/23/2013	2.96"	6.26								54.0	50.2	13.8
6/11/2013	1.56"	6.35								10.6	34.6	10.4
10/31/2013	0.6"	6.93								9.6	44.0	5.2
11/1/2013	1.25"	7.03								2.5	42.4	8.7
4/12/2014	thaw	7.07								4.3	61.2	1.7
4/14/2014	thaw			6.2						22.9	28.6	1.1
4/15/2014	thaw with 1.21"	6.48								84.4	21.0	0.9
6/25/2014	1.59"	7.05								8.6	47.8	16.4
10/16/2014	0.88"	7.08								3.3	66.9	12.3
11/24/2014	thaw with 0.49"	6.94								14.7	47.5	1.8
4/17/2015	thaw with 0.48"	6.97		10						15.9	65.2	1.6
2003-2015 SUMMARY												
Mean		6.31	8.56	9.18	0.423	0.80	0.191	0.011	86	32.9	61.5	7.1
Max		8.07	42.2	40	1.50	3.95	1.57	0.051	1860	639	152	17.0
n		51	16	30	14	14	14	14	40	53	51	51

Note: Blank in column indicates sample not analyzed
& : Samples received in this project required pH. The EPA hold time for this analysis is 15 minutes. Analysis was performed as soon as possible upon arrival at the laboratory.
$: Sample was decanted at the lab from the 1/2 gal. plastic into an 8 oz. plastic with no head space.

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: LSRM0.1 (MS-11)
Little Spruce Brook, below 2004 restoration

DATE	Event Inches of rain	pH s.u.	Alk. mg/L	Chloride mg/L	TP mg/L	TDP mg/L	TSS mg/L	Turbidity NTU	Conductivity umho/cm	TEMP DEG C
8/23/2000	1.00						4	1.9	87.7	14.5
9/4/2000	0.30						2	1.0	113	14.0
10/6/2000	0.95						15	3.6	95.8	9.0
4/22/2001	0.25	7.75					86	3.1	39.0	1.4
10/4/2003	0.50							27.6	80.0	8.7
10/15/2003	1.31							74.8	107.5	10.8
3/25/2004	0.50						81	60.0	145	1.0
8/12/2004	0.78						1190	59.5	143.5	11.5
12/1/2004		7.43					12	10.9	77.8	2.0
4/23/2005	0.86	6.79					3	1.00	59.5	4.3
8/31/2005	2.54	6.90					14	13.5	98.2	17.9
9/27/2005	1.88	7.17					2	1.98	85.4	12.6
1/12/2006	thaw w/ rain						2	1.84	88	1.4
5/19/2006	2.75"over 40 hrs.	6.97					64	50.8		
9/29/2006	1.79" over 21 hrs	7.8					3	27.7	66	11.8
10/20/2006	1.00	6.95					41	55.3	48.2	8.6
3/15/2007	thaw w/ 1" of rain	5.77					56	36.6	166	0.3
4/20/2007	thaw w/no rain	6.63					2	2.78	71.7	3.5
8/6/2007	1.36"	7.19					23	22.0	65.1	16.2
11/6/2007	1.32"	7.41					32	42.4	123	5.6
4/1/2008	thaw w/ 0.07" rain	7.30					196	168.0	166	0.7
4/16/2008	thaw w/ no rain	6.72					9	6.70	76.6	3.2
10/2/2008	2 events 0.9"/0.7"	6.55			< 0.01	< 0.005	< 2	2.42	120.4	10.9
10/2/2008	second sample	6.86					25	15.2	86.1	10.8
3/11/2009	thaw w/ 0.53" rain	7.19					< 2	6.1	263.1	1.3
3/29/2009	thaw w/ 0.24" rain	6.3					5	3.43	98.0	1.9
5/29/2009	1.18"	5.34	16.3				4	1.4	121	8.3
7/31/2009	0.57"	6.89					< 2	2.57	195.3	16
10/7/2009	0.93"	7.16					7	5.68	88.9	10
11/20/2009	1.05"	6.51					17	6.01	71.7	
3/19/2010	thaw w/ no rain	7.21					* 55	* 144	111.8	3.0
3/23/2010	thaw w/ 1.78" rain	6.33	7.8				70	45.1	52.3	1
9/30/2010	0.65"			25			7	8.25	136.7	14.5
10/1/2010	3.70"			8.4			306	138	62.7	13.5
10/15/2010	2.92"			7.8			94	41.9		7.7
4/11/2011	thaw with 0.96"			21			35	16.3	65.3	0.7
4/25/2011	thaw w/0.12" rain			19			6	2.7	66.1	3.4
6/23/2011	1"			25				15.1	117.3	15.2
11/30/2011	thaw with 0.35"			21			3	2.37	153	8.0
3/12/2012	thaw			89			14	7.00	210	3.1
5/8/2012	0.6" -1.2"	7.03		18			88	61.6	80.7	9.3

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: LSRM0.1 (MS-11)
Little Spruce Brook, below 2004 restoration

DATE	Event Inches of rain	pH s.u.	Alk. mg/L	Chloride mg/L	TP mg/L	TDP mg/L	TSS mg/L	Turbidity NTU	Conductivity umho/cm	TEMP DEG C
6/27/2012	2.33"	7.2		15			20	6.3	82.6	14.3
9/5/2012	2.15"	7.18		41			2	1.8	189.3	15.6
1/14/2013	thaw	6.28		36				3.3	100.2	1.3
1/31/2013	thaw with 1.69"	5.93		34				6.4	91.9	0.2
5/23/2013	2.96"	6.07						69.0	96.4	15.4
6/11/2013	1.56"	6.21						9.17	76.8	11.8
11/1/2013	1.25"	7.21						1.91	91.7	9.4
4/14/2014	thaw			33				17.60	97.4	1.6
4/15/2014	thaw with 1.21"	7.03						31.20	71.2	0.7
6/25/2014	1.59"	7.38						11.30	101	18.1
10/16/2014	0.88"	7.72						11.00	229.3	13.0
11/24/2014	thaw with 0.49"	7.42						19.90	123.3	1.4
4/17/2015	thaw with 0.48"	7.19		14				12.60	88.6	-0.9
2003-2015 SUMMARY										
Mean		6.44	12.1	27.1			69	27.8	108.5	7.5
Max		7.80	16.3	89.0			1190	168	263	18.1
n		36	2	15			36	50	48	48

Note: Blank in column indicates sample not analyzed
* Turbidity value from 3/19/10 was suspect. Endyne, Inc. reran the TSS and Turbidity on March 25 (past holding time) and got 56 mg/L for TSS and NTU for turbidity.

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: Outlet 1 - Direct Basin Outlet
Sediment Pond near Mansfield Parking Area

DATE	Event Inches of rain	pH s.u.	Alk. mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU	Conductivity umho/cm	TEMP DEG C
11/6/2007	1.32"	7.14			56	80.7	29.4	4.2
4/1/2008	thaw w/ 0.07" rain	7.30			296	307.0	413	3.7
4/16/2008	thaw w/ no rain	6.31			223	15.2	261.9	5.5
10/2/2008	2 events 0.9"/0.7"	6.70			< 2	2.96	52.1	12.4
3/11/2009	thaw w/ 0.53" rain	8.03			519	910	643	0.4
3/29/2009	thaw w/ 0.24" rain	6.44			68	138	244.6	2.5
5/29/2009	1.18"	6.98	9.55		4	2.9	25.9	8.1
7/31/2009	0.57"	6.92			9	7.06	43.5	16.1
11/20/2009	1.05"	6.41			7	3.51	24.6	
9/30/2010	0.65"			< 2.5	3	2.47	36.7	16.4
10/1/2010	3.70"			< 2.5	9	3.73	28.4	15.3
10/15/2010	2.92"			< 2.5	10	6.17		8.2
4/11/2011	thaw with 0.96"			27	280	479	96.4	2.4
4/25/2011	thaw w/0.12" rain			8	17	45	78.6	10.2
6/23/2011	1"			< 2.5	7	4.61	52.1	19.1
11/30/2011	thaw with 0.35"			110	92	142	459	9.7
3/12/2012	thaw			210	70	119	542	2.2
3/21/2012	thaw			130	19	54.1	411.3	13.6
5/8/2012	0.6" -1.2"	6.66		6.5	15	12.9	52.9	12.6
6/27/2012	2.33"	7.28		< 2.5	5	5.66	28.8	16.7
9/5/2012	2.15"	6.89		< 2.5	17	10.9	49.2	18.1
1/14/2013	thaw	6.16				46.2	259.8	0.4
1/31/2013	thaw with 1.69"	4.74				71.9	419.2	0.3
5/23/2013	2.96"	6.63				13	40.9	18.1
6/11/2013	1.56"	6.20				3.1	39.1	14.6
10/31/2013	0.6"	7.27				5.26	31.6	4.6
11/1/2013	1.25"	7.40				3.24	34.3	10.2
4/14/2014	thaw			49		7.35	207.3	8.9
4/15/2014	thaw with 1.21"	8.26				166	83.6	5.7
6/25/2014	1.59"	7.94				86.5	88.2	20.3
10/16/2014	0.88"	7.49				9.6	54.5	16.1
11/24/2014	thaw with 0.49"	8.00				279	181.7	0.2
4/17/2015	thaw with 0.48"	9.00		70		436	359.0	2.3
2007-2015 SUMMARY								
Mean		6.02	9.55	44.7	82	105.5	167.9	9.3
Max		9.00	9.55	210.0	519	910	643	20.3
n		23	1	14	21	33	32	32

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: Outlet 1b - Mix of Tributary and Basin Outlet
Sediment Pond near Mansfield Parking Area

DATE	Event Inches of rain	pH s.u.		Chloride mg/L	TSS mg/L	Turbidity NTU	Conductivity umho/cm	TEMP DEG C
10/7/2009	0.93"	6.67			12	3.66	24.3	9.6
3/23/2010	thaw w/ 1.78" rain	7.10			165	41.4	19.3	1.1
10/1/2010	3.70"		<	2.5	76	14.7	36.1	13.5
10/15/2010	2.92"		<	2.5	53	16.5		7.7
4/11/2011	thaw with 0.96"			24	260	352	71.2	1.8
3/12/2012	thaw			120	39	56.9	317.6	8.0
3/21/2012	thaw			18	21	13.9	48.0	6.5
4/12/2014	thaw	7.06				26.6	201.4	4
2007-2014 SUMMARY								
Mean		6.83		33.4	89	65.7	102.6	6.5
Max		7.10		120.0	260	352	318	13.5
n		2		5	7	8	7	8

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: Tributary That Enters West Branch at Mansfield Basin Direct Outlet

DATE	Event Inches of rain	pH s.u.	Chloride mg/L	TSS mg/L	Turbidity NTU	Conductivity umho/cm	TEMP DEG C
6/11/2013	1.56"	6.26			46.8	49.9	9.7
10/31/2013	0.6"	6.79			12.5		
4/15/2014	thaw with 1.21"	6.45			220		
10/16/2014	0.88"	6.55			9	119.4	10.9
11/24/2014	thaw with 0.49"	6.62			110	101.9	5
SUMMARY 2013-2014							
Mean		6.50			79.7	90.4	8.5
Max		6.79			220	119.4	10.9
Min		6.26			9.0	49.9	5.0
n		5			5	3	3

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: Outlet 2
Snowmaking Pond

DATE	Event Inches of rain	pH s.u.	Alk. mg/L	Chloride mg/L		TSS mg/L	Turbidity NTU	Conductivity umho/cm	TEMP DEG C
11/6/2007	1.32"	7.21				11	15.0	111	5.6
4/1/2008	thaw w/ 0.07" rain	7.22				32	28.8	424	1.5
4/16/2008	thaw w/ no rain	6.78			<	2	2.7	186.2	5.5
10/2/2008	2 events 0.9"/0.7"	6.68				12	18.6	180	12.9
3/11/2009	thaw w/ 0.53" rain	7.67				5	12	465	2.0
3/29/2009	thaw w/ 0.24" rain	6.38				5	8.55	105	2.9
5/29/2009	1.18"	5.81	26			7	11	224	8.9
7/31/2009	0.57"	6.89				3	4.20	244.8	16.7
10/7/2009	0.93"	6.77				17	16.1	156.4	10.3
11/20/2009	1.05"	6.84				17	29.6	97.2	
3/23/2010	thaw w/ 1.78" rain	7.05				35	53.5	114.9	2.9
9/30/2010	0.65"			25		11	12.3	140.4	13.9
10/1/2010	3.70"			7.6		82	57.5		
10/15/2010	2.92"			19		31	30.9		9.1
4/11/2011	thaw with 0.96"			47		28	27.9	158	2.7
4/25/2011	thaw w/0.12" rain			27		2	2.5	50.6	5.3
11/30/2011	thaw with 0.35"			8.7		18	16.8	48.5	8.4
3/12/2012	thaw			73	<	2	18.3	340.4	3.0
5/8/2012	0.6" -1.2"	6.77		37		3	29.7		9.4
6/27/2012	2.33"	6.91		14		21	20.1		
9/5/2012	2.15"	6.85		16		12	6.69	129	
1/14/2013	thaw	6.18					3.86	141.6	1.7
1/31/2013	thaw with 1.69"	6.2					9.5	116.2	0.1
5/23/2013	2.96"	5.71					12	14.3	12.6
6/11/2013	1.56"	6.37					7.25	180.2	
11/1/2013	1.25"	7.16					9.18	117	8.2
4/14/2014	thaw						27.9	122	
4/15/2014	thaw with 1.21"						175	66.9	
6/25/2014	1.59"	7.16					5.56	90.8	
10/16/2014	0.88"	7.14					7.12	194.1	10.6
11/24/2014	thaw with 0.49"	7.17					14.9	137	
4/17/2015	thaw with 0.48"	7.2		32			0.33	306	4.9
2007-2015 SUMMARY									
Mean		6.47	26	28		17	21.7	166.5	6.9
Max		7.67	26	73		82	175.0	465	16.7
n		23	1	11		21	32	28	23

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: Outlet 3
Big Spruce basin

DATE	Event Inches of rain	pH s.u.	Alk. mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU	Conductivity umho/cm	TEMP DEG C
11/6/2007	1.32"	7.36			30	43.2	79.4	5.4
10/2/2008	2 events 0.9"/0.7"	7.10			4	7.95	90.0	11.1
3/11/2009	No flow out of basin							
3/29/2009	No flow out of basin							
5/29/2009	1.18"	7.25	19.9		19	19	45.9	8.2
7/31/2009	0.57"	6.98			18	16.7	123.8	16.6
10/7/2009	0.93"	7.02			63	64.7	63.7	9.8
11/20/2009	1.05"	7.07			73	112	55.6	
3/23/2010	thaw w/ 1.78" rain	7.00			113	83		
9/30/2010	0.65"			3.0	18	10.2		
10/1/2010	3.70"			< 2.5	32	18.4		
10/15/2010	2.92"			< 2.5	64	64.1		
4/25/2011	thaw w/0.12" rain			5.7	7	8.6	61	
6/23/2011	1"			15	210	210	102	
11/30/2011	thaw with 0.35"			3.3	16	19.7	49.3	
5/8/2012	0.6" -1.2"	6.74		6.6	85	62.0		
6/27/2012	2.33"	7.29		7.3	20	30.1		
9/5/2012	2.15"	6.75		6.8	11	8.0	86.8	
1/14/2013	thaw	7.70				9.2		1
1/31/2013	thaw with 1.69"	5.20				46.9	34.5	-0.3
5/23/2013	2.96"	6.38				184.0	9	15
6/11/2013	1.56"	5.66				19.3	68.9	
11/1/2013	1.25"	7.22				12.5		
4/14/2014	thaw					113.0	60.3	
4/15/2014	thaw with 1.21"					47.7	65.8	
6/25/2014	1.59"	7.42				9.4	91	
10/16/2014	0.88"	7.35				118.0		
11/24/2014	thaw with 0.49"	7.26				104.0	142	
4/17/2015	thaw with 0.48"			24		24.7	115	
2007-2015 SUMMARY								
Mean		6.25	19.9	7.7	49	54.3	74.7	8.4
Max		7.70	19.9	24.0	210	210	142	16.6
n		18	1	10	16	27	18	8

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: Outlet 4 - Exit Basin
Exit of Mansfield Basin outflow

DATE	Event Inches of rain	pH s.u.		Chloride mg/L	TSS mg/L	Turbidity NTU	Conductivity umho/cm	TEMP DEG C
3/21/2012	thaw			11	17	8.12	46.3	5.7
5/8/2012	0.6" -1.2"	6.86		2.5	30	25.8	30.9	8.4
6/27/2012	2.33"	6.62	<	2.5	24	18.4		
9/5/2012*	2.15"							
1/14/2013*	thaw							
1/31/2013*	thaw with 1.69"							
5/23/2013	2.96"	6.09				122	26.8	12.5
6/11/2013	1.56"	6.25				7	50.5	
10/31/2013	0.6"	7.17				11.1		
11/1/2013	1.25"	7.32				7.13	46.7	9.5
4/15/2014	thaw with 1.21"					31.3	45.8	
6/25/2014	1.59"	7.43				8.79	69.1	19.3
10/16/2014	0.88"	7.76				27.5	66.6	15.8
11/24/2014	thaw with 0.49"	7.93				288	137.4	-0.7
4/17/2015	thaw with 0.48"	8.30		24		233	143.0	3.5
2012-2015 SUMMARY								
Mean		6.71		10.0	24	65.7	66.3	9.3
Max		8.30		24.0	30	288	143	19.3
n		10		4	3	12	10	8

* The Mansfield Exit Basin was inadvertently sampled from the tributary that enters the West Branch through a pipe near the basin outflow.

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: Outlet 5 - Upper Barnes Basin Outlet

DATE	Event Inches of rain	pH s.u.	Chloride mg/L	TSS mg/L	Turbidity NTU	Conductivity umho/cm	TEMP DEG C
6/11/2013	1.56"	6.22			34.1	45.7	13.3
6/25/2014	1.59"	7.07			51.3	79.1	18
2013-2014 SUMMARY							
Mean		6.46			42.7	62.4	16
Max		7.07			51.3	79.1	18
n		2			2	2	2

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: Outlet 6 - Lower Barnes Basin Outlet

DATE	Event Inches of rain	pH s.u.	Chloride mg/L	TSS mg/L	Turbidity NTU	Conductivity umho/cm	TEMP DEG C
6/27/2012	2.33"	6.36	4.6	22	21.5	39.8	13
6/11/2013	1.56"	6.07			24.2	52.3	11.5
4/15/2014	thaw with 1.21"	7.40			85.5	117.2	2.2
6/25/2014	1.59"	7.56			26.2	77.3	19.8
2012-2014 SUMMARY							
Mean		6.47	4.6	22	39.4	71.7	12
Max		7.56	4.6	22	85.5	117.2	20
n		4	1	1	4	4	4

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: SCBUS
Ski Club Brook Upstream

DATE	Event Inches of rain	pH s.u.		Chloride mg/L		TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
3/23/2010	thaw w/ 1.78" rain						7.68		
9/30/2010	0.65"		<	2.5		8	3.24	49.0	13.7
10/1/2010	3.70"		<	2.5		14	9.41	27.9	13.2
10/15/2010	2.92"		<	2.5		34	2.15		7.7
4/11/2011	thaw with 0.96"		<	2.5		28	7.29	20.9	0.8
6/23/2011	1"		<	2.5		11	6.40	33.9	14.3
11/30/2011	thaw with 0.35"		<	2.5		3	14.9	59.8	7.5
3/12/2012	thaw			3.5		3	1.11	36.3	3.5
5/8/2012	0.6" -1.2"	6.98	<	2.5		70	55.5	19.0	8.2
6/27/2012	2.33"	6.97	<	2.5		18	6.3	34.8	14.1
9/5/2012	2.15"	6.77	<	2.5	<	2	1.3	33.3	15.1
1/14/2013	thaw	7.74		5.6			2.3	38.3	1.1
1/31/2013	thaw with 1.69"	5.29		16			3.5	61.3	0.3
5/23/2013	2.96"	6.44					48	28.4	12.9
6/11/2013	1.56"	5.54					8.23	27.7	11
11/1/2013	1.25"	7.12					51.20	43.4	8.4
4/14/2014	thaw			4.8			57.00	25.5	0
4/15/2014	thaw with 1.21"	6.41					8.72	22.7	0.1
6/25/2014	1.59"	7.02					8.47	40.8	18.1
10/16/2014	0.88"	7.19					33.40	53.8	12.3
11/24/2014	thaw with 0.49"	6.93					28.80	73.0	0.6
4/17/2015	thaw with 0.48"	6.57		6.2			6	49.9	0.7
2010-2015 SUMMARY									
Mean		6.12		4.2		19.1	16.8	39.0	7.8
Max		7.74		16.0		70.0	57.0	73.0	18.1
n		13		14		10	22	20	21

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: SCBDS
Ski Club Brook Downstream

DATE	Event Inches of rain	pH s.u.		Chloride mg/L	TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
3/23/2010	thaw w/ 1.78" rain					92.7	30.3	1.1
9/30/2010	0.65"		<	2.5	7	4.28	52.9	14
10/1/2010	3.70"		<	2.5	51	21.2	33.1	13.2
10/15/2010	2.92"		<	2.5	56	22.3		7.8
4/11/2011	thaw with 0.96"			3.7	120	19.2	25.5	0.8
6/23/2011	1"			2.7	190	67.9	41.8	14.5
11/30/2011	thaw with 0.35"		<	2.5	12	4.38	62.8	7.8
3/12/2012	thaw			31	17	1.84	89.3	2.6
5/8/2012	0.6" -1.2"	6.98		4.1	120	109	38.2	8.2
6/27/2012	2.33"	7.11		6.1	24	5.56	53.9	13.6
9/5/2012	2.15"	6.96		8.4	9	3.75	69.4	15.3
1/14/2013	thaw	7.71		22		3.78	75.4	0.9
1/31/2013	thaw with 1.69"	5.21		42		25.8	100.4	-0.4
5/23/2013	2.96"	6.44				139	39.0	13.8
6/11/2013	1.56"	5.68				14.9	43.5	10.9
11/1/2013	1.25"	7.03				26.1	98.3	9.9
4/12/2014	thaw	7.01				6.75	67.4	0.2
4/14/2014	thaw			11		171	38.3	0.2
4/15/2014	thaw with 1.21"	6.6				29.1	37.0	0.2
6/25/2014	1.59"	7.37				10.8	62.5	17.9
10/16/2014	0.88"	7.25				7.05	96.4	12.7
11/24/2014	thaw with 0.49"	7.16				64.3	82.3	1.1
4/17/2015	thaw with 0.48"	6.85				20.8	7.9	-1.2
2010-2015 SUMMARY								
Mean		6.16		10.8	60.6	37.9	56.6	7.2
Max		7.71		42.0	190.0	171.0	100.4	17.9
n		14		13	10	23	22	23

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: LT 0.1
Long Trail Tributary

DATE	Event Inches of rain	pH s.u.		Chloride mg/L	TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
3/21/2012	thaw		<	2.5	11	1.65	14.7	6.3
5/8/2012	0.6" -1.2"	6.68	<	2.5	9	4.60	13.0	7.2
6/27/2012	2.33"	5.95	<	2.5	16	3.82	12	11.1
9/5/2012	2.15"	5.25	<	2.5	6	2.05	14.9	14.5
1/14/2013	thaw	6.85		2.8		2.52	15.7	1.4
1/31/2013	thaw with 1.69"	4.28	<	2.5		3.5	13.8	-0.4
5/23/2013	2.96"	5.77				69	8.3	10.6
6/11/2013	1.56"	6.52				15.8	12.2	9.6
10/31/2013	0.6"	5.91				2.21	17.2	4.5
11/1/2013	1.25"	5.75				2.62	17.9	7.6
4/14/2014	thaw		<	2.5		53.4	15.6	0.3
4/15/2014	thaw with 1.21"	5.07				79.2	12.8	1.3
6/25/2014	1.59"	5.85				6.05	19.9	12.8
10/16/2014	0.88"	5.74				1.45	18.6	12.6
11/24/2014	thaw with 0.49"	6.07				4.7	16.5	0.2
4/17/2015	thaw with 0.48"	6.23	<	2.5		3.84	25.8	1.4
2012-2015 SUMMARY								
Mean		5.26		2.5	10.5	16.0	15.6	6.3
Max		6.85		2.8	16.0	79.2	25.8	14.5
n		14		8	4	16	16	16

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: GB 0.1
Gondola Brook

DATE	Event Inches of rain	pH s.u.		Chloride mg/L	TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
3/21/2012	thaw		<	2.5	11	1.20	16.0	4.1
5/8/2012	0.6" -1.2"	6.61	<	2.5	10	1.55	13.4	6.6
6/27/2012	2.33"	5.31	<	2.5	36	6.18	11.7	11.4
9/5/2012	2.15"	6.19	<	2.5	5	0.84	14.8	14.2
1/14/2013	thaw	7.07	<	2.5		0.62	12.4	0.8
1/31/2013	thaw with 1.69"	4.34	<	2.5		0.78	7.4	0.3
5/23/2013	2.96"	6.06				68	11.0	10.0
6/11/2013	1.56"	6.63				6.94	12.1	9.4
10/31/2013	0.6"	6.46				2.37	21.7	3.5
11/1/2013	1.25"	6.24				1.58	16.2	7.7
4/14/2014	thaw		<	2.5		7.44	17.1	0.5
4/15/2014	thaw with 1.21"	5.72				54.6	13.8	0.0
6/25/2014	1.59"	6.4				1.25	20.8	12.2
10/16/2014	0.88"	6.37				0.99	20.0	11.9
11/24/2014	thaw with 0.49"	6.57				4.14	21.4	-0.1
4/17/2015	thaw with 0.48"	6.56		4.7		2.16	38.7	1.2
2012-2015 SUMMARY								
Mean		5.39		2.8	15.5	10.0	16.8	5.9
Max		7.07		4.7	36.0	68.0	38.7	14.2
n		14		8	4	16	16	16

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: Swale to Big Spruce Basin

DATE	Event Inches of rain	pH s.u.		Chloride mg/L	TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
5/8/2012	0.6" -1.2"	6.91	<	4.6	320	94.7		
6/27/2012	2.33"	7.43		3.7	39	69.1	59.6	16.8
6/11/2013	1.56"	6.08				32.3	69.5	13
11/1/2013	1.25"	7.32				10.3	98.3	9.9
4/12/2014	thaw	7.35				27.3	203.5	1.5
4/14/2014	thaw			87		51.9	231.6	3.7
4/15/2014	thaw with 1.21"					35.7	320	3.9
6/25/2014	1.59"	7.62				8.75	131	21.9
11/24/2014	thaw with 0.49"	7.38				185	120.8	-0.7
4/17/2015	thaw with 0.48"			320		76.6	1120	3.2
2012-2015 SUMMARY								
Mean		6.78		103.8	180	59.2	261.6	8.1
Max		7.62		320.0	320	185.0	1120.0	21.9
n		7		4	2	10	9	9

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: Tributary That Enters West Branch at Mansfield Basin Direct Outlet

DATE	Event Inches of rain	pH s.u.	Turbidity NTU	Conductivity umho/cm	TEMP DEG C
6/11/2013	1.56"	6.26	46.8	49.9	9.7
10/31/2013	0.6"	6.79	12.5		
4/15/2014	thaw with 1.21"	6.45	220		
10/16/2014	0.88"	6.55	9	119.4	10.9
11/24/2014	thaw with 0.49"	6.62	110	101.9	5
SUMMARY					
Mean		6.50	79.7	90.4	9
Max		6.79	220	119.4	11
n		10	5	3	3

Note: Blank in column indicates sample not analyzed

Stowe Mountain Resort
Monitoring Station Event Chemistry
Station: Tributary that enters West Branch near Mansfield Exit Basin - Big Pipe

DATE	Event Inches of rain	pH s.u.	Chloride mg/L	TSS mg/L	Turbidity NTU	Cond. umho/cm	TEMP DEG C
9/5/2012	2.15"	6.82	5.5	3	2.64	52.1	15.2
1/14/2013	thaw	6.45			1.37		1.2
1/31/2013	thaw with 1.69"	6.91			1.5		0.3
5/23/2013	2.96"	6.33			28	19.3	11.6
6/11/2013	1.56"	6.08			17	34.5	
10/31/2013	0.6"	6.88			13.7		5.3
4/15/2014	thaw with 1.21"	6.47			34.7		
6/25/2014	1.59"	7.07			4.5		
10/16/2014	0.88"	7.13			1.13	61	12.2
11/24/2014	thaw with 0.49"	7.06			6.9		
2012-2015 SUMMARY							
Mean		6.58	5.5	3	11.14	41.73	7.63
Max		7.13	5.5	3	35	61.00	15.20
n		10	1	1	10	4	6

Note: Blank in column indicates sample not analyzed

APPENDIX 2

EPSC IMPROVEMENT PROJECTS REPORT

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Snowplant to Vehicles road

REPAIR DATE: Week End 5 25 14

COMMENTS: The road connecting the Snowplant to the Vehicle Maintenance Shop is used exclusively for winter operations. This road is closed during the summer season for all vehicular traffic. This road was re-graded, waterbars were re-built, bridge was cleaned of all accumulated sand and debris, sediment basins were restored and all associated disturbance was seeded and mulched.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Mansfield to Spruce Snow-Cat road

REPAIR DATE: Week End 6 1 14

COMMENTS: This road is used for snowcats to travel from the Mansfield side to the Spruce side of the resort. The road was re-graded, waterbars enlarged, sediment basins cleaned, and the bridge was shoveled and swept to remove all sand/soil. The entire road was seeded and mulched. This road is closed to all traffic during the non-winter months to ensure good vegetated cover & stability.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Lower Barnes Parking Lot

REPAIR DATE: Week End 6 8 14

COMMENTS: Lower Barnes parking lot received general maintenance. The lot was graded and track packed, ditches were cleaned, stone checks dams were enlarged, and the sediment basin was cleaned out.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Bus Lot @ Mansfield Exit

REPAIR DATE: Week End 6 15 14

COMMENTS: The Bus Lot is located at the end of the main Mansfield Parking lot. This area receives most of its traffic during the winter months. The perimeter ditches were cleaned, new stone was brought in to re-armor conveyances, and the capacity was re-stored in the sediment basins by removing all accumulated material. The entire parking area was scraped of sand and then tracked packed.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Mansfield Exit

REPAIR DATE: Week End 6 15 14

COMMENTS: The Mansfield exit receives maintenance annually. Sediment was removed to restore design capacity, stone was added to increase bank armor, check dams were installed, and all areas were seeded and mulched upon project completion.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Duckwalk

REPAIR DATE: Week End 6 22 14

COMMENTS: The Duckwalk is used periodically to access a mid mountain location/intersection at the Sunspot. When traffic increases on this road due to Mtn Ops. maintenance activities this road requires a re-build. The re-build included waterbar work and grading activities.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Mansfield Lot Basin

REPAIR DATE: Week End 6 29 14

COMMENTS: Percy was hired as the contractor to clean the Mansfield parking lot basin and forebay. These basins were de-watered through a silt bag into a vegetated area. An excavator was used to remove accumulated sediment. Additional stone was added to the berm that segregates the forebay from the main basin. The large rock at the two dispersion pads was reshaped to better handle large flows. All disturbed soils were seeded and mulched by Percy.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Gondola Workroad

REPAIR DATE: Week End 7 6 14 and 9 7 14

COMMENTS: The Gondola workroad is the only access to this portion of the resort. This summer the road received above average traffic due to construction activities. This road was maintained throughout the summer on an as needed basis. The above pictures represent one of the more significant restoration efforts. Waterbar work was completed, three damaged culverts were replaced, and seeding & mulching was done to limit the road to a single lane.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Perry Merrill and Gondolier

REPAIR DATE: Week End 7 6 14

COMMENTS: Perry Merrill and Gondolier both received general trail maintenance. Parts of the trail were re-graded, waterbars were enlarged/repaired, and all disturbed soils were seeded and mulched.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Middle Nosedive

REPAIR DATE: Week End 7 13 14

COMMENTS: Middle Nosedive was in need of general waterbar maintenance. All existing waterbars were enlarged. One wet area received additional waterbar installations.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Bottom Perry Merrill @ Midway Base Lodge

REPAIR DATE: Week End 7 20 14

COMMENTS: General waterbar work and sediment removal occurred in this area.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Crossover

REPAIR DATE: Week End 7 20 14

COMMENTS: Crossover is the main access for the Mansfield side of the resort. This road receives traffic year round. This road is maintained on a constant basis; these photos depict one of the more significant re-builds. Waterbars were enlarged, sediment traps were restored, and a few new diversionary conveyances were installed.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Houghton's Workroad

REPAIR DATE: Week End 7 20 14

COMMENTS: Houghton's workroad received general maintenance. Stone was placed in waterbars last year during a heavy construction season. This stone has worked really well at armoring waterbars/conveyances. A few additional waterbars were added adjacent to the Liftline booster.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Yucca Flats (Gondola Base)

REPAIR DATE: Week End 7 20 14

COMMENTS: Yucca Flats is the base area between Midway Lodge and the Gondola Barn. This area has a large stormwater contributing area both from the ski slope as well as the adjacent parking lots. The main conveyance received multiple loads of 5-8" rip-rap to improve the stability during large flow events.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Tyro below Crossover

REPAIR DATE: Week End 8 3 14

COMMENTS: Tyro below crossover received waterbar maintenance. This area is occasionally used for travel. Waterbars were repaired and a few additional conveyances were installed.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Middle National

REPAIR DATE: Week End 8 3 14

COMMENTS: Middle National received some traffic during the construction of a mid mountain booster station. Basic work was done during construction but a larger scale restoration was deemed appropriate. A large culvert traveling beneath trail had a failed header. This header was diassassembled and rebuilt, large portions of the trail were re-graded, waterbars were enlarged or added, all grading was tracked packed, and the entire area was seeded and mulched.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Triple Base access rd

REPAIR DATE: Week End 8 3 14

COMMENTS: This road is used to access the Triple base as well as the other base area lifts and buildings. This area received general waterbar maintenance and sediment basin restoration.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Big Spruce rd and Lot

REPAIR DATE: Week End 8 10 14

COMMENTS: Big Spruce rd, lot, and associated basins received general maintenance activity. The small basins along the road were cleaned, both large basins had all accumulated sediment removed, the conveyances through the lot were re-established and the perimeter swale was re-shaped and lined with erosion control fabric.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Catwalk at Spruce

REPAIR DATE: Week End 8 10 14 Catwalk @ Spruce

COMMENTS: This road serves as access to the top of the Meadows Quad. This road was used during summer construction activities. These photos depict a large rebuild which entailed re-grading the road, re-directing waterbars away from the construction activities, and seeding & mulching all appropriate areas.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: East Run

REPAIR DATE: Week End 8 10 14

COMMENTS: Due to the previous year's snowmaking improvements on East Run some additional stabilization was needed. This trail received waterbar maintenance, additional conveyances, and some basic re-grading mid trail to address erosion rills. The area was seeded and mulched after project completion.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: North Slope

REPAIR DATE: Week End 8 10 14

COMMENTS: North Slope was in need of general maintenance. Parts of this trail are somewhat wet. Waterbars and perimeter conveyances were re-established and/or enlarged.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Lower West Run

REPAIR DATE: Week End 8 10 14

COMMENTS: West Run received general trail grading and waterbar improvements. All disturbed areas were seeded and mulched upon project completion.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Sterling Rd.

REPAIR DATE: Week End 8 31 14

COMMENTS: Sterling Workroad is the summer access road to Spruce Peak. Some trail encroachment work was performed this summer exposing some old water conveyances. These ditches were re-shaped when needed. The road was also cleaned up; repairing worn waterbars.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: West Lot

REPAIR DATE: Week End 8 31 14

COMMENTS: Both sediment basins servicing the West Lot were cleaned of all accumulated sand and debris. The adjacent road (not pictured) was paved to improve stability and ease of travel. This will greatly reduce the sediment load into these basins.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Liftline & Crossover Intersection

REPAIR DATE: Week End 9 7 14

COMMENTS: Liftline Crossover intersection receives a lot of skier traffic during the winter months. The original culvert design created a large hole/hazard on the trail edge. This projects purpose was to repair a failed header and minimize the trailside hazard. The existing culvert and two associated drain lines were extended, waterbars were re-established, and the diversionary waterbar above the workroad was enlarged. The entire area was seeded and mulched upon project completion.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Dalton's

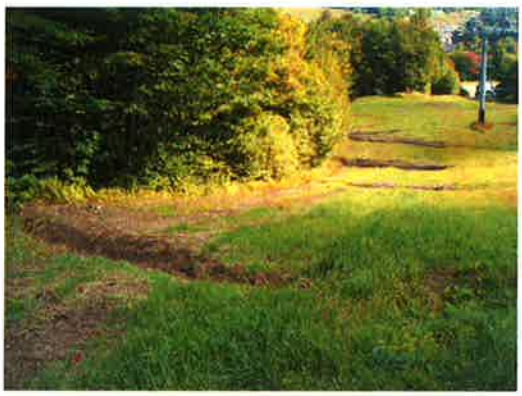
REPAIR DATE: Week End 9 14 14

COMMENTS: Dalton's is a small trail below Crossover. A few waterbars were added and existing conveyances were enlarged.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Liftline below Crossover

REPAIR DATE: Week End 9 14 14



COMMENTS: Liftline below crossover received general waterbar work. Disturbed areas were seeded and mulched.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Starr below Crossover

REPAIR DATE: Week End 9 14 14

COMMENTS: Starr below crossover received general waterbar work.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: 5th Ave Bottom

REPAIR DATE: Week End 9 19 14

COMMENTS: This mid mountain location receives various types of traffic. One additional waterbar was installed and others were enlarged/repaired.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: 5th Ave Top

REPAIR DATE: Week End 9 19 14

COMMENTS: This intersection is located adjacent to the Triple Top. Waterbars were enlarged and reshaped.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Lullaby Lane

REPAIR DATE: Week End 9 21 14

COMMENTS: Lullaby Lane is a work road connecting the Crossover to the Toll Road. This area received general waterbar maintenance as well as some perimeter ditch work. All areas were seeded and mulched after earthwork was complete.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Lower Hayride

REPAIR DATE: Week End 9 21 14

COMMENTS: Lower Hayride has some naturally wet terrain. Waterbar maintenance was needed to convey this moisture off of the ski trail. Existing waterbars were enlarged and on new conveyance was installed. This area was seeded and mulched once excavation was complete.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: T-Line

REPAIR DATE: Week End 9 21 14

COMMENTS: T-line receives early season snowcat travel. This trail received general waterbar maintenance.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Tyro Top

REPAIR DATE: Week End 9 21 14

COMMENTS: Top of Tyro serves as an access point to a large mid-mountain intersection. This area received traffic during summer maintenance activities. This area received general waterbar maintenance, perimeter ditch work, and was tracked packed to harden the road surface.

Erosion Prevention/Sediment Control Operation-and-Maintenance Report

REPAIR LOCATION: Primary Pumphouse

REPAIR DATE: Week End 10 5 14

COMMENTS: The forebay and the diversion basin at the Primary Pumphouse are cleaned annually. These areas are dewatered and all accumulated sediment is removed and trucked to the Tom Lot. The use of a silt curtain was implemented this season and will be utilized in the future.

APPENDIX 3

SUBSTRATE COMPOSITION

Stowe Mountain Resort Water Quality Management Plan
PEBBLE COUNT SUBSTRATE SUMMARY - 2014

Stowe Mountain Resort Pebble Count and Sediment Observations 2000-2014

Station	Location		RM	Sample Size	D50 (mm)	Estimated Embedd.	Fines %	Particles <8mm %	Results meeting targets? % fines (≤8%)	Particles <8 mm (≤20%)	Embedd. (≤25%)
West Branch at Picnic Area WB8.8			8.8								
		2011		100	64-128	0-25%	7%	10%	yes	yes	yes
		2012		100	64-128	0-25%	4.0%	11.0%	yes	yes	yes
		2013		100	32-64	5-25%	3.0%	13.0%	yes	yes	yes
		2014		100	32-64	0-25%	1.0%	8.0%	yes	yes	yes
MS-16B	West Branch downstream of Lift WB8.0		8.0								
		2006		300	32-64	0-25%	1.7%	10%	yes	yes	yes
		2007		301	64-128	0-25%	0.30%	9%	yes	yes	yes
		2008		300	64-128	25-50%	2.7%	8%	yes	yes	no
		2009		300	64-128	0-25%	2.3%	9%	yes	yes	yes
		2010		305	16-32	0-25%	5.6%	22%	yes	no	yes
		2011		300	32-64	0-25%	4.0%	19%	yes	yes	yes$
		2012		306	64-128	0-25%	1.3%	7.2%	yes	yes	yes
		2013		100	16-32	25-50%	9.0%	17.0%	no	yes	no
		2014		100	64-128	0-25%	2.0%	12.0%	yes	yes	yes
MS-8	West Branch above Spruce WB7.5		7.5								
		2000		315	64-128	26-50%	2.0%	10%	yes	yes	no
		2003		348	64-128	30%	4.0%	10%	yes	yes	no
		2004		366	32-64	26-50%	7.1%	19%	yes	yes	no
		2005		300	64-128	26-50%	5.7%	14%	yes	yes	no
		2006		300	64-128	0-25%	4.3%	13%	yes	yes	yes
		2007		300	64-128	0-25%	0.7%	7%	yes	yes	yes
		2008		301	64-128	0-25%	3.7%	12%	yes	yes	yes
		2009		295	64-128	0-25%	5.1%	11%	yes	yes	yes
		2010		300	16-32	0-25%	7.3%	23%	yes	no	yes
		2011		300	64-128	0-25%	5.3%	16%	yes	yes	yes
		2012		308	64-128	26-50%	0.6%	7.5%	yes	yes	no
		2013		100	64-128	25-50%	1.0%	11.0%	yes	yes	no
		2014		100	64-128	0-25%	1.0%	8.0%	yes	yes	yes
MS-14	West Branch upstream of Pinnacle WB6.5		6.5								
		2000		303	32-64	5-25%	4.0%	18%	yes	yes	yes
		2003		370	16-32	0-25%	4.1%	14%	yes	yes	yes
		2004		336	32-64	26-50%	4.5%	16%	yes	yes	no
		2005		300	64-128	26-50%	1.7%	15%	yes	yes	no
		2006		300	32-64	0-25%	2.0%	13%	yes	yes	yes
		2007		301	32-64	5-25%	2.3%	12%	yes	yes	yes
		2008		304	64-128	0-25%	3.3%	10%	yes	yes	yes
		2009		301	32-64	0-25%	4.3%	16%	yes	yes	yes
		2010		300	32-64	0-25%	6.7%	17%	yes	yes	yes
		2011		300	64-128	25-50%	1.0%	7%	yes	yes	no
		2012		309	64-128	0-25%	2.3%	9.7%	yes	yes	yes
		2013		100	64-128	25-50%	2.0%	9.0%	yes	yes	no**
		2014		100	64-128	0-25%	3.0%	14.0%	yes	yes	yes
MS-10A	Big Spruce above Little Spruce BS0.3		0.3								
		2006		300	32-64	26-50%	7.7%	21%	yes	no	no
		2007		300	32-64	26-50%	4.3%	12%	yes	yes	no
		2008		290	64-128	0-25%	6.9%	17%	yes	yes	yes
		2009		300	64-128	26-50%	6.0%	12%	yes	yes	no
		2010		300	16-32	25-50%	8.6%	21%	no	no	no
		2011		300	64-128	25-50%	1.3%	7%	yes	yes	no
		2012		302	64-128	0-25%	2.3%	8.3%	yes	yes	yes
		2013		100	64-128	5-25%	1.0%	9.0%	yes	yes	yes
		2014		100	64-128	0-25%	7.0%	12.0%	yes	yes	yes
MS-10	Big Spruce below Little Spruce BS0.2		0.2								
		2000		317	64-128	26-50%	7.0%	18%	yes	yes	no
		2003		357	32-64	26-50%	2.8%	11%	yes	yes	no
		2004		434	32-64	26-50%	4.4%	15%	yes	yes	no
		2005		300	32-64	26-50%	7.7%	20%	yes	yes	no
		2006		300	64-128	26-50%	2.3%	11%	yes	yes	no
		2007		305	32-64	26-50%	3.9%	11%	yes	yes	no
		2008		301	64-128	0-25%	2.7%	10%	yes	yes	yes
		2009		300	64-128	0-25%	3.0%	8%	yes	yes	yes
		2010		300	16-32	25-50%	5.7%	22%	yes	no	no
		2011*		100	32-64	0-25%	2.0%	7%	yes	yes	yes
		2012		100	64-128	0-25%	3.0%	7.0%	yes	yes	yes
		2013		100	64-128	5-25%	3.0%	6.0%	yes	yes	yes
		2014		100	64-128	0-25%	5.0%	8.0%	yes	yes	yes

Stowe Mountain Resort Water Quality Management Plan
PEBBLE COUNT SUBSTRATE SUMMARY - 2014

Stowe Mountain Resort Pebble Count and Sediment Observations 2000-2014

Station	Location		RM	Sample Size	D50 (mm)	Estimated Embedd.	Fines %	Particles <8mm %	Results meeting targets? % fines (≤8%)	Particles <8 mm (≤20%)	Embedd. (≤25%)
MS-13	Lower Pinnacle Brook PB0.1		0.1								
		2000		317	64-128	5-25%	1.0%	7%	yes	yes	yes
		2003		328	64-128	0-25%	2.0%	5%	yes	yes	yes
		2004		335	32-64	0-25%	1.5%	7%	yes	yes	yes
		2005		303	64-128	5-25%	0.0%	6%	yes	yes	yes
		2006		300	64-128	0-25%	0.7%	8%	yes	yes	yes
		2007		304	64-128	0-25%	0.0%	3%	yes	yes	yes
		2008		300	64-128	0-25%	2.3%	6%	yes	yes	yes
		2009		302	64-128	0-25%	0.7%	7%	yes	yes	yes
		2010		300	64-128	0-25%	5.0%	14%	yes	yes	yes
		2011		300	64-128	0-25%	0.0%	2%	yes	yes	yes
		2012		301	64-128	0-25%	0.3%	2.7%	yes	yes	yes
		2013		100	64-128	5-25%	1.0%	3.0%	yes	yes	yes
		2014		100	64-128	5-25%	0.0%	1.0%	yes	yes	yes

Notes:
* = sample taken above pedestrian bridge below waterfall
$ - Station was 26-50% embedded in middle section where biomonitoring samples were collected.
** = at low end of 25-50% range (rated by aquatic biologist performing kick net samples as 0-25%)

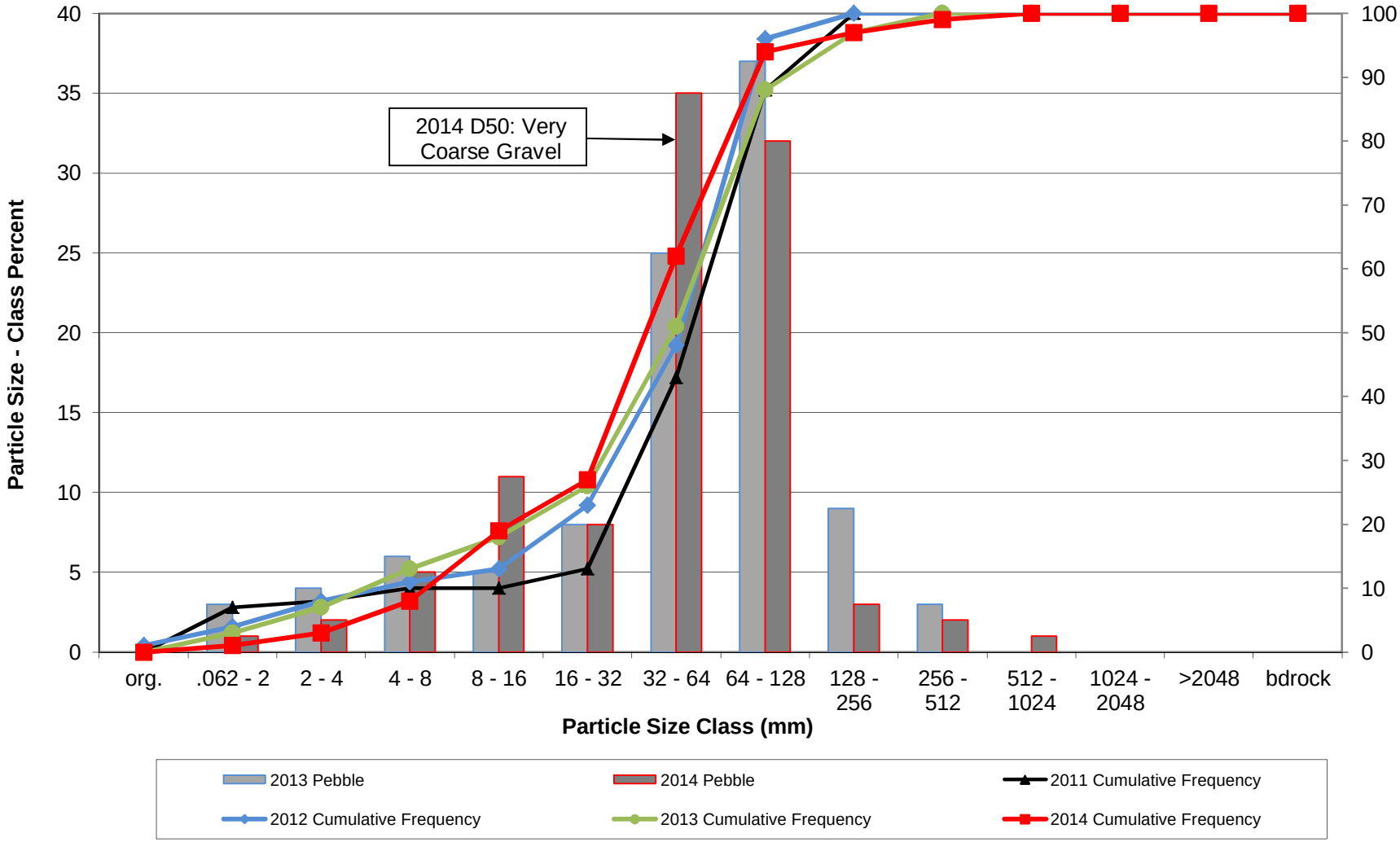
STOWE MOUNTAIN RESORT WATER QUALITY MANAGEMENT PLAN (SMRWQ)
SUBSTRATE DATA COLLECTION
Sampling Date: September 22, 2014 **Samplers: MN, AM**
Sample Location: WB8.8, West Branch
(At Picnic Area above resort - start near restroom and go upstream 100 feet)

Station Habitat Observations	Sample #1	Sample #2	Sample #3
Canopy cover:	**75%**		
Embeddedness:	**0-25%**		
Bank stability:	**75-100%**		

Category	Median Size (mm)	Sample #1	Sample #2	Sample #3	Summary of Samples	% of Total	Total Cumulative Frequency (%)
Organic	org.	0			0	0	0
Fines	.062 - 2	1			1	1	1
Very small gravel	2 - 4	2			2	2	3
Small gravel	4 - 8	5			5	5	8
Medium gravel	8 - 16	11			11	11	19
Coarse gravel	16 - 32	8			8	8	27
Very coarse gravel	32 - 64	35			35	35	62
Small & med. cobble	64 - 128	32			32	32	94
Large cobble	128 - 256	3			3	3	97
Small boulder	256 - 512	2			2	2	99
Medium boulder	512 - 1024	1			1	1	100
Large boulder	1024 - 2048	0			0	0	100
Very large boulder	>2048	0			0	0	100
Bedrock	bdrock	0			0	0	100
Sample Size		100	0	0	100		
Distance (feet)		0-100	100-200	200-300	0-300		

D50 Particle Size	Very Coarse Gravel
Dominant Size Class	Very Coarse Gravel

SMR - Water Quality Management Plan
WB8.8 Pebble Count 2011 - 2014

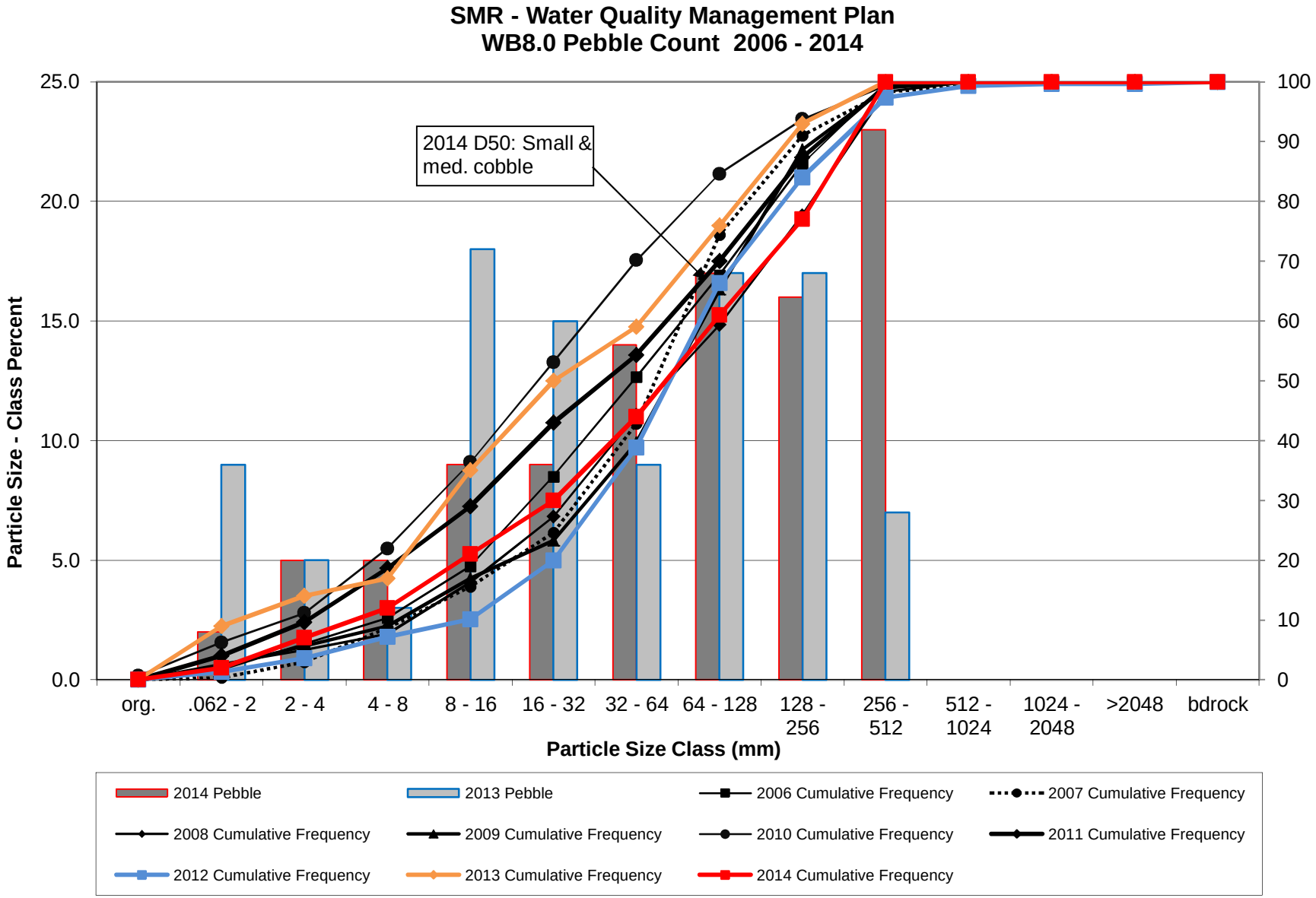


STOWE MOUNTAIN RESORT WATER QUALITY MANAGEMENT PLAN (SMRWQ)
SUBSTRATE DATA COLLECTION
Sampling Date: September 22, 2014 **Samplers: MN, AM**
Sample Location: WB8.0, West Branch
(Start immediately below transfer lift and go downstream 300')

Station Habitat Observations	Sample #1	Sample #2	Sample #3
Canopy cover:	40%		
Embeddedness:	14%		
Bank stability:	75-100%		

Category	Median Size (mm)	Sample #1	Sample #2	Sample #3	Summary of Samples	% of Total	Total Cumulative Frequency (%)
Organic	org.	0			0	0.0	0.0
Fines	.062 - 2	2			2	2.0	2.0
Very small gravel	2 - 4	5			5	5.0	7.0
Small gravel	4 - 8	5			5	5.0	12.0
Medium gravel	8 - 16	9			9	9.0	21.0
Coarse gravel	16 - 32	9			9	9.0	30.0
Very coarse gravel	32 - 64	14			14	14.0	44.0
Small & med. cobble	64 - 128	17			17	17.0	61.0
Large cobble	128 - 256	16			16	16.0	77.0
Small boulder	256 - 512	23			23	23.0	100.0
Medium boulder	512 - 1024	0			0	0.0	100.0
Large boulder	1024 - 2048	0			0	0.0	100.0
Very large boulder	>2048	0			0	0.0	100.0
Bedrock	bdrock	0			0	0.0	100.0
Sample Size		100	0	0	100		
Distance (feet)		0-100	100-200	200-300	0-300		

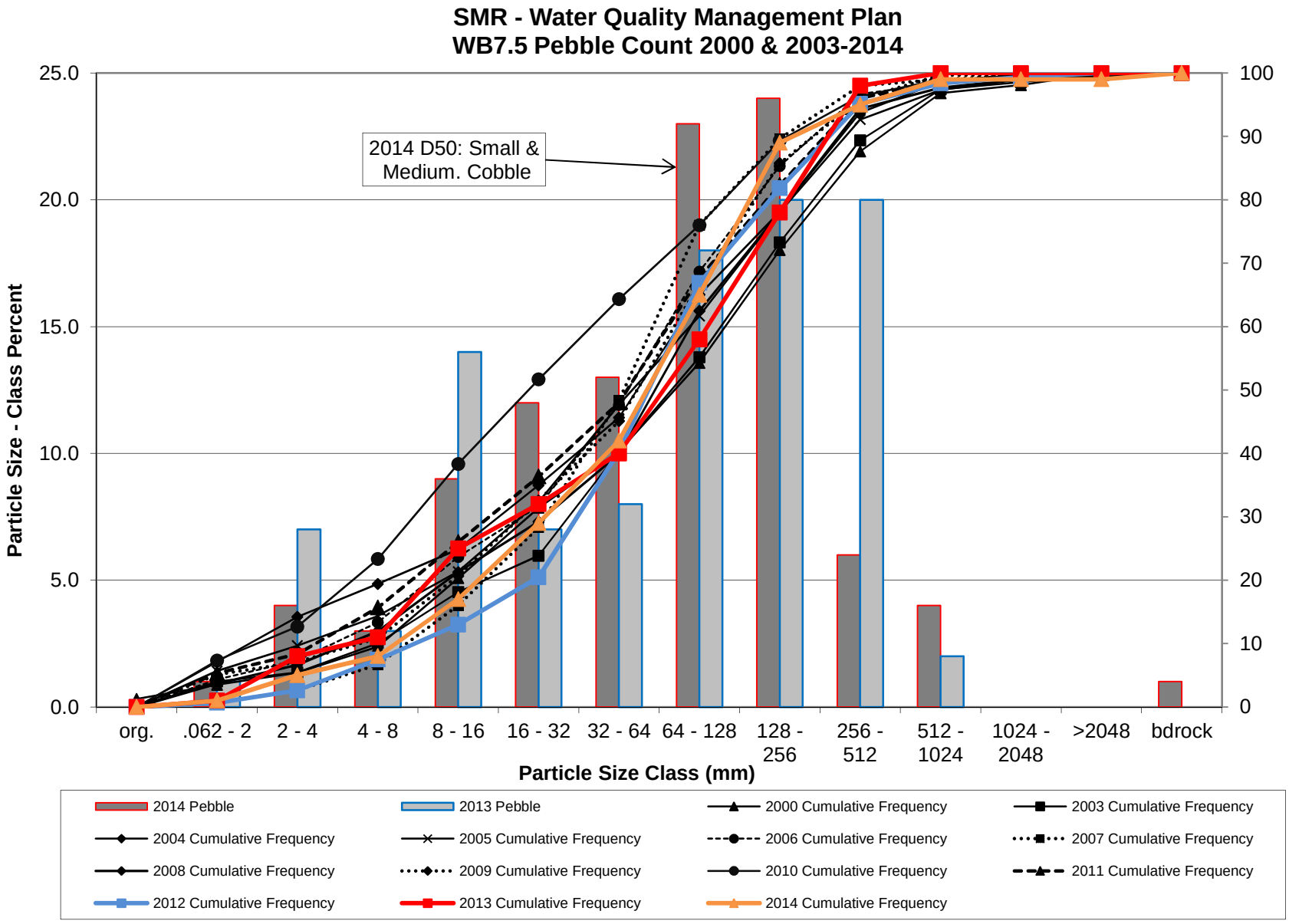
D50 Particle Size	Small & med. Cobble	
Dominant Size Class	Small boulder	


SMR - Water Quality Management Plan
WB8.0 Pebble Count 2006 - 2014
2014 D50: Small & med. cobble
Particle Size - Class Percent
Particle Size Class (mm)
25.0
20.0
15.0
10.0
5.0
0.0
100
90
80
70
60
50
40
30
20
10
0
org.
.062 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64 - 128
128 - 256
256 - 512
512 - 1024
1024 - 2048
>2048
bdrock
2014 Pebble
2013 Pebble
2006 Cumulative Frequency
2007 Cumulative Frequency
2008 Cumulative Frequency
2009 Cumulative Frequency
2010 Cumulative Frequency
2011 Cumulative Frequency
2012 Cumulative Frequency
2013 Cumulative Frequency
2014 Cumulative Frequency

STOWE MOUNTAIN RESORT WATER QUALITY MANAGEMENT PLAN (SMRWQ)
SUBSTRATE DATA COLLECTION
Sampling Date: September 22, 2014 **Samplers: MN, AM**
Sample Location: WB7.5 (MS-8), West Branch
(Start 300 feet upstream of rip-rap on left bank, just upstream from old Hostel)

Station Habitat Observations	Sample #1	Sample #2	Sample #3
Canopy cover:	70%		
Embeddedness:	21%		
Bank stability:	25-50%		

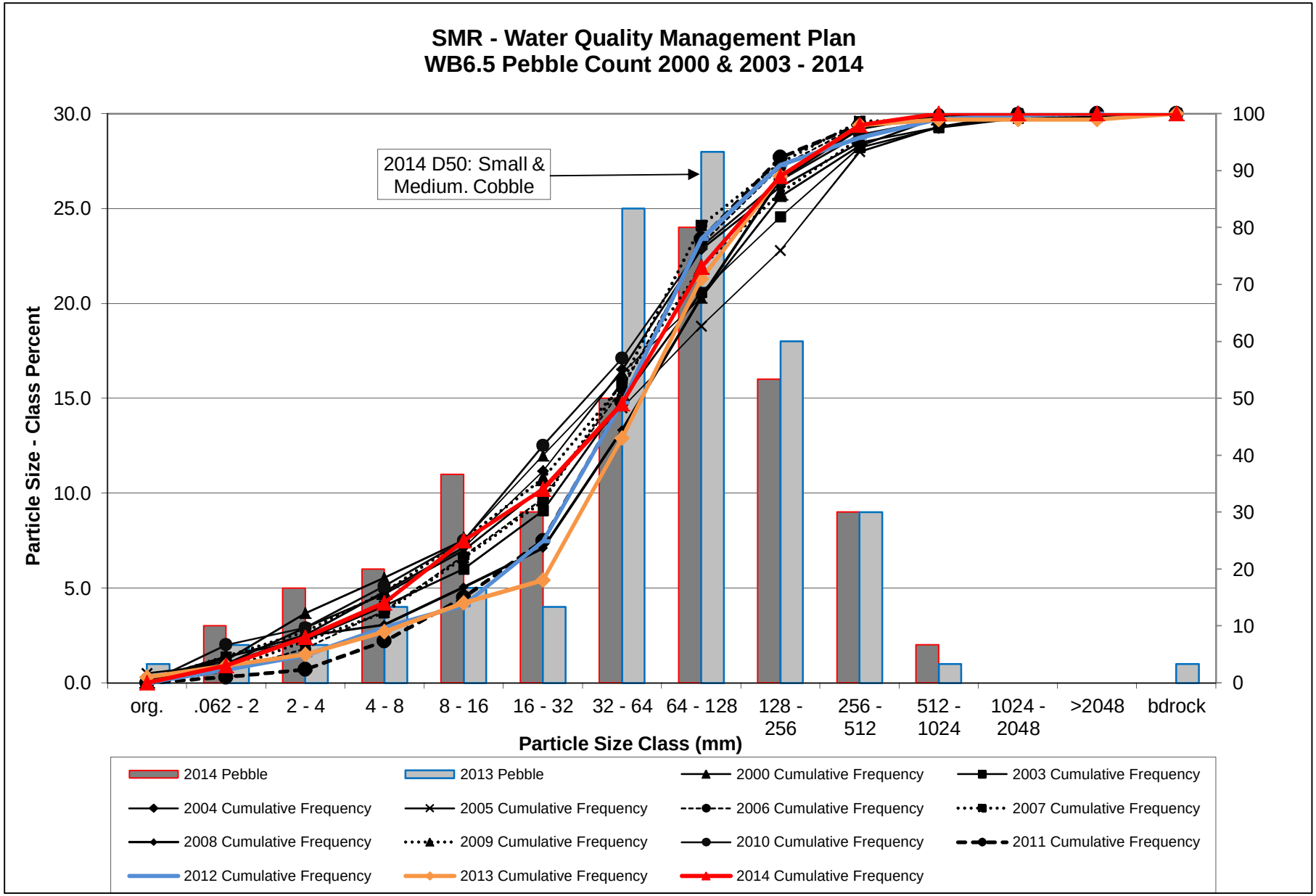
Category	Median Size (mm)	Sample #1	Sample #2	Sample #3	Summary of Samples	% of Total	Total Cumulative Frequency (%)
Organic	org.	0			0	0.0	0.0
Fines	.062 - 2	1			1	1.0	1.0
Very small gravel	2 - 4	4			4	4.0	5.0
Small gravel	4 - 8	3			3	3.0	8.0
Medium gravel	8 - 16	9			9	9.0	17.0
Coarse gravel	16 - 32	12			12	12.0	29.0
Very coarse gravel	32 - 64	13			13	13.0	42.0
Small & med. cobble	64 - 128	23			23	23.0	65.0
Large cobble	128 - 256	24			24	24.0	89.0
Small boulder	256 - 512	6			6	6.0	95.0
Medium boulder	512 - 1024	4			4	4.0	99.0
Large boulder	1024 - 2048	0			0	0.0	99.0
Very large boulder	>2048	0			0	0.0	99.0
Bedrock	bdrock	1			1	1.0	100.0
Sample Size		100	0	0	100		
Distance (feet)		0-100	100-200	200-300	0-300		
D50 Particle Size	Small & med. Cobble						
Dominant Size Class	Large Cobble						


SMR - Water Quality Management Plan
WB7.5 Pebble Count 2000 & 2003-2014
2014 D50: Small & Medium. Cobble
Particle Size - Class Percent
Particle Size Class (mm)
25.0
20.0
15.0
10.0
5.0
0.0
100
90
80
70
60
50
40
30
20
10
0
org.
.062 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64 - 128
128 - 256
256 - 512
512 - 1024
1024 - 2048
>2048
bdrock
2014 Pebble
2013 Pebble
2000 Cumulative Frequency
2003 Cumulative Frequency
2004 Cumulative Frequency
2005 Cumulative Frequency
2006 Cumulative Frequency
2007 Cumulative Frequency
2008 Cumulative Frequency
2009 Cumulative Frequency
2010 Cumulative Frequency
2011 Cumulative Frequency
2012 Cumulative Frequency
2013 Cumulative Frequency
2014 Cumulative Frequency

STOWE MOUNTAIN RESORT WATER QUALITY MANAGEMENT PLAN (SMRWQ)
SUBSTRATE DATA COLLECTION
Sampling Date: September 22, 2014 **Samplers: MN, AM**
Sample Location: WB6.5, Lower West Branch
(Start at confluence with Pinnacle Brook and go upstream)

Station Habitat Observations	Sample #1	Sample #2	Sample #3
Canopy cover:	50%		
Embeddedness:	13%		
Bank stability:	50-75%		

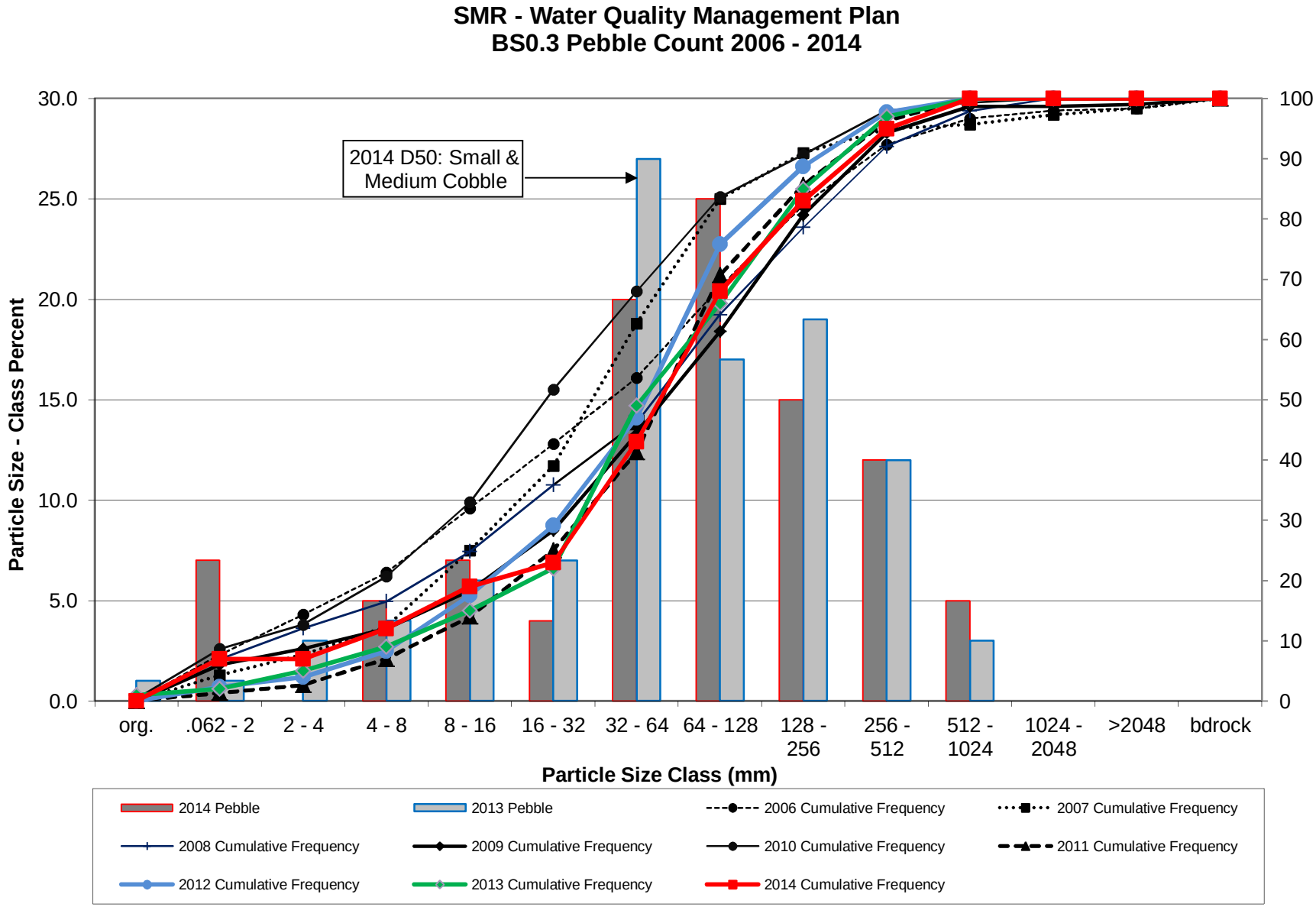
Category	Median Size (mm)	Sample #1	Sample #2	Sample #3	Summary of Samples	% of Total	Total Cumulative Frequency (%)
Organic	org.	0			0	0.0	0.0
Fines	.062 - 2	3			3	3.0	3.0
Very small gravel	2 - 4	5			5	5.0	8.0
Small gravel	4 - 8	6			6	6.0	14.0
Medium gravel	8 - 16	11			11	11.0	25.0
Coarse gravel	16 - 32	9			9	9.0	34.0
Very coarse gravel	32 - 64	15			15	15.0	49.0
Small & med. cobble	64 - 128	24			24	24.0	73.0
Large cobble	128 - 256	16			16	16.0	89.0
Small boulder	256 - 512	9			9	9.0	98.0
Medium boulder	512 - 1024	2			2	2.0	100.0
Large boulder	1024 - 2048	0			0	0.0	100.0
Very large boulder	>2048	0			0	0.0	100.0
Bedrock	bdrock	0			0	0.0	100.0
Sample Size		100	0	0	100		
Distance (feet)		0-100	100-200	200-300	0-300		
D50 Particle Size	Small & med. Cobble						
Dominant Size Class	Small & med. Cobble						


SMR - Water Quality Management Plan
WB6.5 Pebble Count 2000 & 2003 - 2014
2014 D50: Small & Medium. Cobble
Particle Size - Class Percent
Particle Size Class (mm)
org.
.062 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64 - 128
128 - 256
256 - 512
512 - 1024
1024 - 2048
>2048
bdrock
2014 Pebble
2013 Pebble
2000 Cumulative Frequency
2003 Cumulative Frequency
2004 Cumulative Frequency
2005 Cumulative Frequency
2006 Cumulative Frequency
2007 Cumulative Frequency
2008 Cumulative Frequency
2009 Cumulative Frequency
2010 Cumulative Frequency
2011 Cumulative Frequency
2012 Cumulative Frequency
2013 Cumulative Frequency
2014 Cumulative Frequency

STOWE MOUNTAIN RESORT WATER QUALITY MANAGEMENT PLAN (SMRWQ)
SUBSTRATE DATA COLLECTION
Sampling Date: September 22, 2014 **Samplers: MN, AM**
Sample Location: BS0.3, Big Spruce above Club House
(Start at Golf Bridge and go downstream)

Station Habitat Observations	Sample #1	Sample #2	Sample #3
Canopy cover:	85%		
Embeddedness:	18%		
Bank stability:	50-75%		

Category	Median Size (mm)	Sample #1	Sample #2	Sample #3	Summary of Samples	% of Total	Total Cumulative Frequency (%)
Organic	org.	0			0	0.0	0.0
Fines	.062 - 2	7			7	7.0	7.0
Very small gravel	2 - 4	0			0	0.0	7.0
Small gravel	4 - 8	5			5	5.0	12.0
Medium gravel	8 - 16	7			7	7.0	19.0
Coarse gravel	16 - 32	4			4	4.0	23.0
Very coarse gravel	32 - 64	20			20	20.0	43.0
Small & med. cobble	64 - 128	25			25	25.0	68.0
Large cobble	128 - 256	15			15	15.0	83.0
Small boulder	256 - 512	12			12	12.0	95.0
Medium boulder	512 - 1024	5			5	5.0	100.0
Large boulder	1024 - 2048	0			0	0.0	100.0
Very large boulder	>2048	0			0	0.0	100.0
Bedrock	bdrock	0			0	0.0	100.0
Sample Size		100	0	0	100		
Distance (feet)		0-100	100-200	200-300	0-300		
D50 Particle Size	Small & med. cobble						
Dominant Size Class	Small & med. cobble						

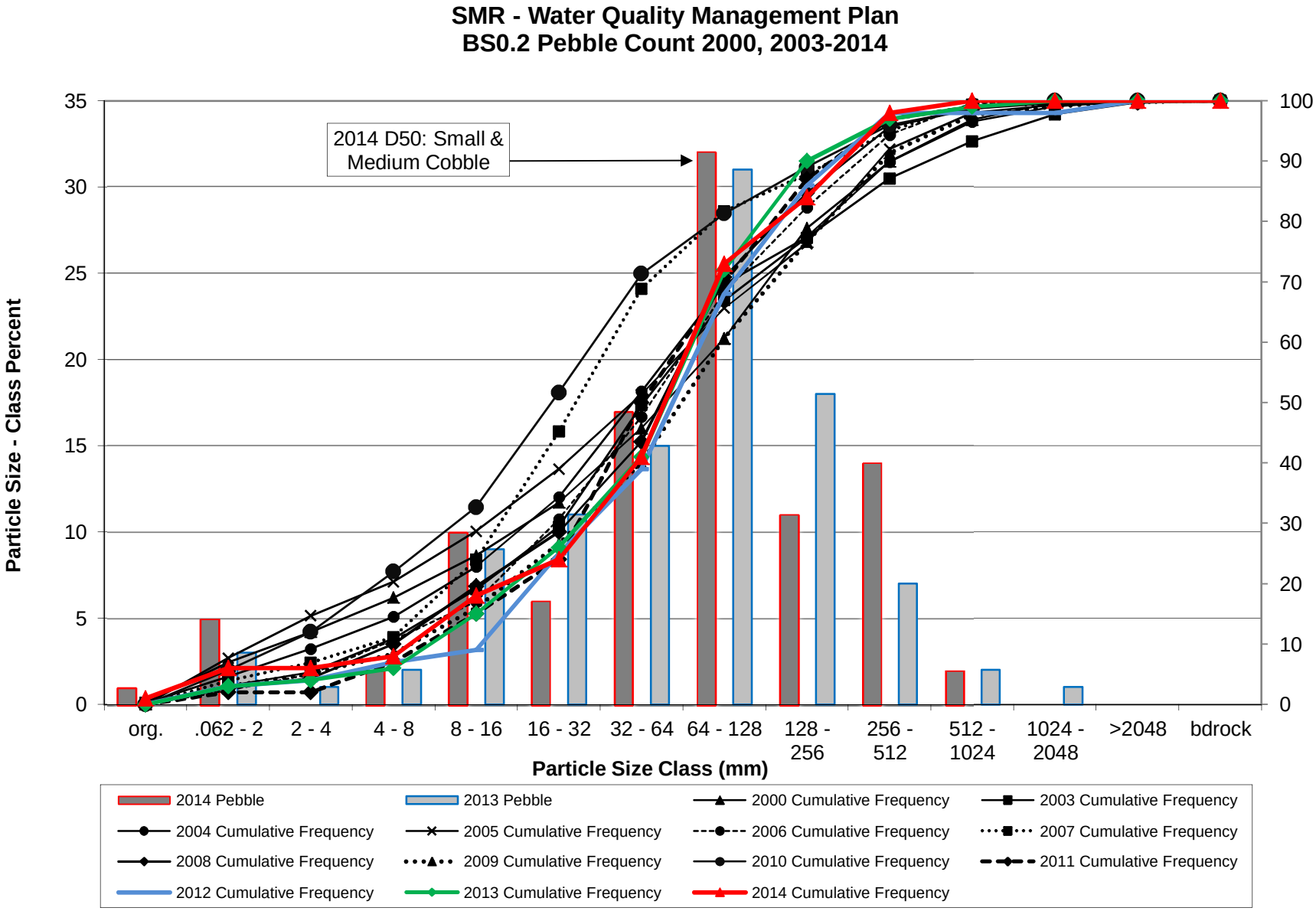

SMR - Water Quality Management Plan
BS0.3 Pebble Count 2006 - 2014
2014 D50: Small & Medium Cobble
Particle Size - Class Percent
Particle Size Class (mm)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
100
90
80
70
60
50
40
30
20
10
0
org.
.062 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64 - 128
128 - 256
256 - 512
512 - 1024
1024 - 2048
>2048
bdrock
2014 Pebble
2013 Pebble
2006 Cumulative Frequency
2007 Cumulative Frequency
2008 Cumulative Frequency
2009 Cumulative Frequency
2010 Cumulative Frequency
2011 Cumulative Frequency
2012 Cumulative Frequency
2013 Cumulative Frequency
2014 Cumulative Frequency

STOWE MOUNTAIN RESORT WATER QUALITY MANAGEMENT PLAN (SMRWQ)
SUBSTRATE DATA COLLECTION
Sampling Date: September 22, 2014 **Samplers: MN, AM**
Sample Location: BS0.2, Lower Big Spruce
(start at riffle just upstream of pedestrian bridge below waterfal and continue downstream)

Station Habitat Observations	Sample #1	Sample #2	Sample #3
Canopy cover:	75%		
Embeddedness:	0-25%		
Bank stability:	75-100%		

Category	Median Size (mm)	Sample #1	Sample #2	Sample #3	Summary of Samples	% of Total	Total Cumulative Frequency (%)
Organic	org.	1			1	1	1
Fines	.062 - 2	5			5	5	6
Very small gravel	2 - 4	0			0	0	6
Small gravel	4 - 8	2			2	2	8
Medium gravel	8 - 16	10			10	10	18
Coarse gravel	16 - 32	6			6	6	24
Very coarse gravel	32 - 64	17			17	17	41
Small & med. cobble	64 - 128	32			32	32	73
Large cobble	128 - 256	11			11	11	84
Small boulder	256 - 512	14			14	14	98
Medium boulder	512 - 1024	2			2	2	100
Large boulder	1024 - 2048	0			0	0	100
Very large boulder	>2048	0			0	0	100
Bedrock	bdrock	0			0	0	100
Sample Size		100	0	0	100		
Distance (feet)		0-100			0-100		

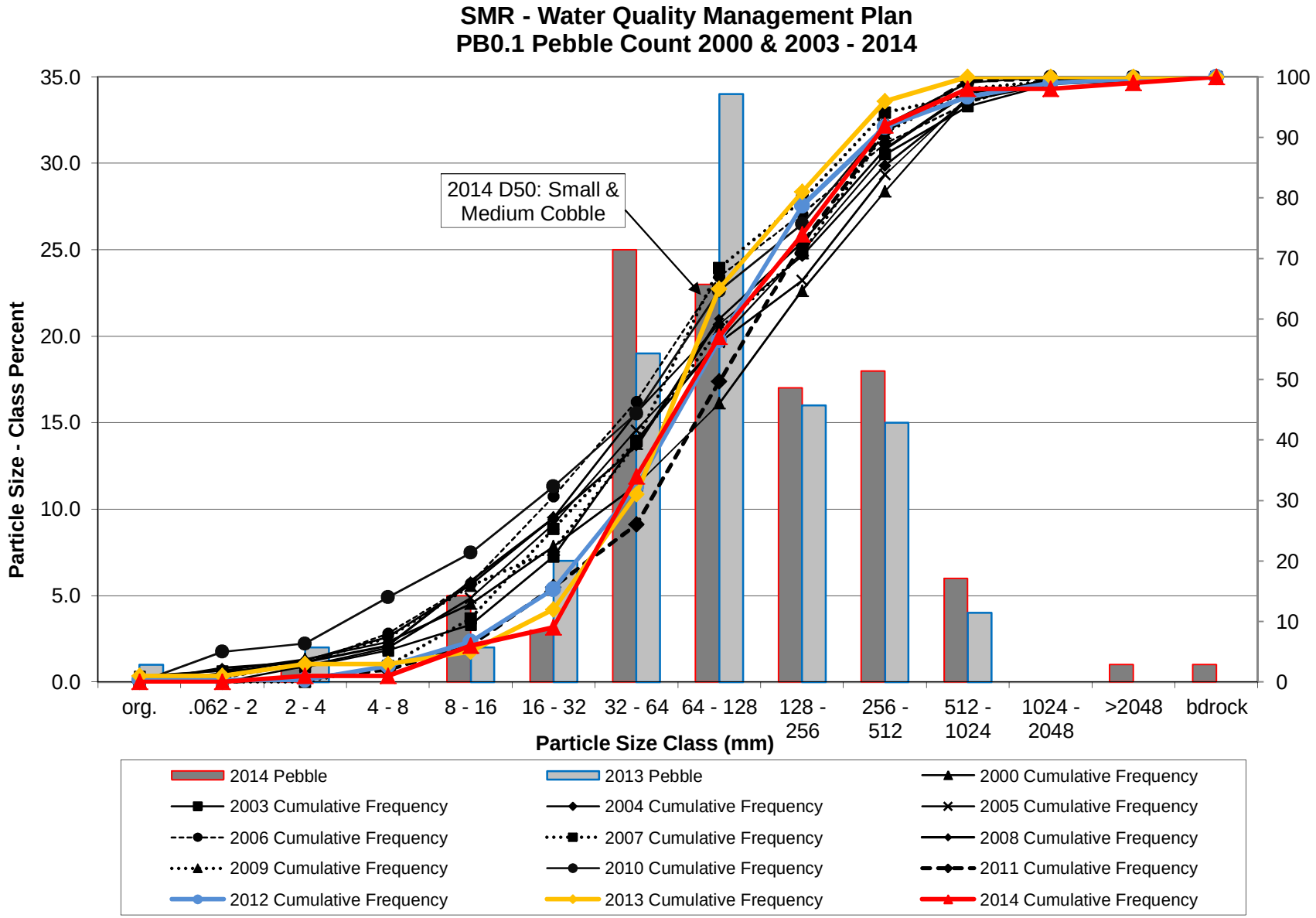
D50 Particle Size	Small & med. cobble
Dominant Size Class	Small & med. cobble


SMR - Water Quality Management Plan
BS0.2 Pebble Count 2000, 2003-2014
2014 D50: Small & Medium Cobble
Particle Size - Class Percent
Particle Size Class (mm)
org.
.062 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64 - 128
128 - 256
256 - 512
512 - 1024
1024 - 2048
>2048
bdrock
2014 Pebble
2013 Pebble
2000 Cumulative Frequency
2003 Cumulative Frequency
2004 Cumulative Frequency
2005 Cumulative Frequency
2006 Cumulative Frequency
2007 Cumulative Frequency
2008 Cumulative Frequency
2009 Cumulative Frequency
2010 Cumulative Frequency
2011 Cumulative Frequency
2012 Cumulative Frequency
2013 Cumulative Frequency
2014 Cumulative Frequency

STOWE MOUNTAIN RESORT WATER QUALITY MANAGEMENT PLAN (SMRWQ)
SUBSTRATE DATA COLLECTION
Sampling Date: September 22, 2014 **Samplers: MN, AM**
Sample Location: PB0.1, Lower Pinnacle

Station Habitat Observations	Sample #1	Sample #2	Sample #3
Canopy cover:	**60%**		
Embeddedness:	**6%**		
Bank stability:	**75-100%**		

Category	Median Size (mm)	Sample #1	Sample #2	Sample #3	Summary of Samples	% of Total	Total Cumulative Frequency (%)
Organic	org.	0			0	0.0	0.0
Fines	.062 - 2	0			0	0.0	0.0
Very small gravel	2 - 4	1			1	1.0	1.0
Small gravel	4 - 8	0			0	0.0	1.0
Medium gravel	8 - 16	5			5	5.0	6.0
Coarse gravel	16 - 32	3			3	3.0	9.0
Very coarse gravel	32 - 64	25			25	25.0	34.0
Small & med. cobble	64 - 128	23			23	23.0	57.0
Large cobble	128 - 256	17			17	17.0	74.0
Small boulder	256 - 512	18			18	18.0	92.0
Medium boulder	512 - 1024	6			6	6.0	98.0
Large boulder	1024 - 2048	0			0	0.0	98.0
Very large boulder	>2048	1			1	1.0	99.0
Bedrock	bdrock	1			1	1.0	100.0
Sample Size		100	0	0	100		
Distance (feet)		0-100	100-200	200-300	0-300		
D50 Particle Size	Small & med. cobble						
Dominant Size Class	Very coarse gravel						


SMR - Water Quality Management Plan
PB0.1 Pebble Count 2000 & 2003 - 2014
2014 D50: Small & Medium Cobble
Particle Size - Class Percent
Particle Size Class (mm)
org.
.062 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64 - 128
128 - 256
256 - 512
512 - 1024
1024 - 2048
>2048
bdrock
2014 Pebble
2013 Pebble
2000 Cumulative Frequency
2003 Cumulative Frequency
2004 Cumulative Frequency
2005 Cumulative Frequency
2006 Cumulative Frequency
2007 Cumulative Frequency
2008 Cumulative Frequency
2009 Cumulative Frequency
2010 Cumulative Frequency
2011 Cumulative Frequency
2012 Cumulative Frequency
2013 Cumulative Frequency
2014 Cumulative Frequency

APPENDIX 4

HABITAT AND BIOMONITORING

Lotic Benthos Field Sheet

Site Name: WB 8.8

River (site):	West Branch Little River	River Mile:	8.8	Site ID:	493238000088	BioLab ID:	
Date:	9/22/2014	Time:	12:30pm	Crew :	C. Szal		
Site Description:	Picnic area						
Town:	Stowe	Stream Order:		Drainage Area (km2):	3.1	Elevation (ft):	1605
Latitude:	44.539645	Longitude:	-72.790595	Lat/Long source (GPS,USGS Map, Datum):		USGS Map	
Weather:	cloudy			Flow/Weather Prev. (2 wks/2days):		Small rainfall event last week	
Surrounding Land Use:	forest, Notch Road					light rain last night	

Sampling Information:

Sampler:	C. Szal	Gear:	KN	Effort time (min)		Mesh (um)	500
Area (m^2)		Quantitative (Y/N):	N	# Reps:	2	Comp/rep	4

Periphyton Cover: For each type 0-100% (see separate page for Periphyton Cover Form)

Diatom:	80%	Filamentous Green:		and length (in):			
Blue Green:	10%	Moss:	Trace	Green:	Trace	Other:	
General Trophic Rating:	0	(0=oligo, 5 = eutrophic)					

Embeddedness: (5) 0-5% Excel, (4) 5-25% V Good, (3) 25-50% Good, (2) 50-75% Fair, (1) >75% Poor

Silt rating (0-5):	1	CPOM rating (leaf packs) (0 - none to 5 - high):	3
Lg Woody Debris (>4" dia) #:	0	/100m (reach)	

General Water Type:

Riffle	X	Winder		Other			
Warm		Cold		Mixed			
Channelized (Y/N):	N	US Dam (Y/N):	N	Other modifications:			
B.F. Width (ft)	15-20	Wetted Width (ft)	12	Riffle Depth (ft)	0.17-0.33	Pool Depth (ft)	2

Bank Stability: EX, (VG) G, F, P

Velocity Range (Estimated): (S) <0.4 ft/sec, (M) 0.4-2 ft/sec, (F) >2 ft/sec Velocity(meas.): _____ ft/sec

Riparian Vegetation: (both sides, does not need to add up to 100%

Riparian Width (ft):		Left:	30	Right:	>100	(facing upstream)	
% Overstory:	Softwood	10	Hardwood	90			
% Understory:	Shrub (brush)	40	Grass	0	Herbaceous	30	
% Canopy:	100, 90, 80, (70), 60, 50, 40, 30, 20, 10, 0			Overhead Canopy:	Open, Partly Open, or (Closed)		

Water Quality Parameters:

	Sampler:		Meter (type, #):		
Baseflow or Freshet	Present Flow:	H (M) L	Annotate?:		
Temp Air (°F): 45	Temp Water (°C):	6.5			

General Observations (circle all that apply): Overall Aesthetic Rating 0 (poor) - 5 (exc.) 5

A: Debris Obvious Pollution: Sludge, Sawdust, Paper Fiber, (Sand), Silt, Sewage, Oily Sheen, Trash, Iron, Scum, None, Black Rocks

B: Water Clarity: (Clear), Slightly Turbid, Moderately Turbid, Very Turbid

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, Blue-Gn

Aquatic Organisms Observed: Mussels, Crayfish, Gastropods, Fish, Other

Observations:

Pebble Count Field Form

River (site): West Branch Little River Site ID: 493238000088
River Mile: 8.8
Site Description: Picnic area
Date: 9/22/2014

Periphyton Cover Observations

Moss Cover Index				
Category	0	1 (<5%)	2 (5-25%)	3 (>25%)
Observations	48	2	1	0

Macro-Algae Cover Index				
Category	0	1 (<5%)	2 (5-25%)	3 (>25%)
Observations	50	1	0	0

Micro-Algae Cover Index							
Category	0	1 (slimy)	2 (draw line)	3 (0.5-1mm)	4 (1-5 mm)	5 (5-20 mm)	6 (>20 mm)
Observations	13	33	4	1	1	0	0

Lotic Benthos Field Sheet

Site Name: WB 8.0

River (site):	West Branch Little River	River Mile:	8.0	Site ID:	493238000080	BioLab ID:	
Date:	9/22/2014	Time:	10:30am	Crew :	C. Szal		
Site Description:	Below lift connector (MS-16B)						
Town:	Stowe	Stream Order:		Drainage Area (km2):	6.5	Elevation (ft):	1470
Latitude:	44.5302778	Longitude:	-72.7847222	Lat/Long source (GPS,USGS Map, Datum):		USGS Map	
Weather:	light rain			Flow/Weather Prev. (2 wks/2days):		Small event last week, light rain	
Surrounding Land Use:	Ski area, resort, forest					last 24hr	

Sampling Information:

Sampler:	C. Szal	Gear:	KN	Effort time (min)		Mesh (um)	500
Area (m^2)		Quantitative (Y/N):	N	# Reps:	2	Comp/rep	4

Periphyton Cover: For each type 0-100% (see separate page for Periphyton Cover Form)

Diatom:	90%	Filamentous Green:	Trace	and length (in):			
Blue Green:	5%	Moss:	2%	Green:		Other:	
General Trophic Rating:	1	(0=oligo, 5 = eutrophic)					

Embeddedness: (5) 0-5% Excel, (4) 5-25% V Good, (3) 25-50% Good, (2) 50-75% Fair, (1) >75% Poor

Silt rating (0-5):	2	CPOM rating (leaf packs) (0 - none to 5 - high):	2		
Lg Woody Debris (>4" dia) #:	0	/100m (reach)			

General Water Type:

Riffle	X	Winder		Other			
Warm		Cold		Mixed			
Channelized (Y/N):	Y	US Dam (Y/N):	N	Other modifications:			
B.F. Width (ft)	35	Wetted Width (ft)	25	Riffle Depth (ft)	0.5	Pool Depth (ft)	2

Bank Stability: EX, VG, G, F, P

Velocity Range (Estimated): (S) <0.4 ft/sec, (M) 0.4-2 ft/sec, (F) >2 ft/sec Velocity(meas.): _____ ft/sec

Riparian Vegetation: (both sides, does not need to add up to 100%

Riparian Width (ft):		Left:	30	Right:	10	(facing upstream)	
% Overstory:	Softwood	10	Hardwood	90			
% Understory:	Shrub (brush)	30	Grass	10	Herbaceous	40	
% Canopy:	100, 90, 80, 70, 60, 50, 40, 30, 20, 10, 0			Overhead Canopy:	Open, Partly Open, or Closed		

Water Quality Parameters:		Sampler:		Meter (type, #):		
Baseflow or Freshet		Present Flow:	H M L	Annotate?:		
Temp Air (°F):	50	Temp Water (°C):	10.8	fpH: 7.34	fCond: 27	D.O.%: 78.1
				water chemistry data from Steve Fiske		D.O.mg/L: 10.1

General Observations (circle all 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, Black Rocks

B: Water Clarity: Clear, Slightly Turbid, Moderately Turbid, Very Turbid stain

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, Blue-Gn

Aquatic Organisms Observed: Mussels, Crayfish, Gastropods, Fish, Other

Observations:

Strong iron seeps

Pebble Count Field Form

River (site): West Branch Little River Site ID: 493238000080
River Mile: 8.0
Site Description: Below lift connector (MS-16B)
Date: 9/22/2014

Periphyton Cover Observations

Moss Cover Index				
Category	0	1 (<5%)	2 (5-25%)	3 (>25%)
Observations	67	4	1	2

Macro-Algae Cover Index				
Category	0	1 (<5%)	2 (5-25%)	3 (>25%)
Observations	68	5	1	0

Micro-Algae Cover Index							
Category	0	1 (slimy)	2 (draw line)	3 (0.5-1mm)	4 (1-5 mm)	5 (5-20 mm)	6 (>20 mm)
Observations	2	68	2	0	2	0	0

Lotic Benthos Field Sheet

Site Name: WB 7.5

River (site):	West Branch Little River	River Mile:	7.5	Site ID:	493238000075	BioLab ID:	
Date:	9/22/2014	Time:	1:30pm	Crew :	C. Szal		
Site Description:	Upstream of Big Spruce Brook Confluence (MS-8)						
Town:	Stowe	Stream Order:		Drainage Area (km2):	9	Elevation (ft):	1415
Latitude:	44.5266667	Longitude:	-72.7802778	Lat/Long source (GPS,USGS Map, Datum):		USGS Map	
Weather:	cloudy			Flow/Weather Prev. (2 wks/2days):		Small event last week, light rain	
Surrounding Land Use:	Ski area, resort, forest					last night	

Sampling Information:

Sampler:	C. Szal	Gear:	KN	Effort time (min)		Mesh (um)	500
Area (m^2)		Quantitative (Y/N):	N	# Reps:	2	Comp/rep	4

Periphyton Cover: For each type 0-100% (see separate page for Periphyton Cover Form)

Diatom:	90%	Filamentous Green:		and length (in):			
Blue Green:	Trace	Moss:	Trace	Green:		Other:	
General Trophic Rating:	1	(0=oligo, 5 = eutrophic)					

Embeddedness: (5) 0-5% Excel, (4) 5-25% V Good, (3) 25-50% Good, (2) 50-75% Fair, (1) >75% Poor

Silt rating (0-5):	2-3	CPOM rating (leaf packs) (0 - none to 5 - high):	3		
Lg Woody Debris (>4" dia) #:	0	/100m (reach)			

General Water Type:

Riffle	X	Winder		Other			
Warm		Cold		Mixed			
Channelized (Y/N):	Y	US Dam (Y/N):	N	Other modifications:			
B.F. Width (ft)	35	Wetted Width (ft)	25	Riffle Depth (ft)	0.5	Pool Depth (ft)	3

Bank Stability: EX, VG, G, F, P

Velocity Range (Estimated): (S) <0.4 ft/sec, (M) 0.4-2 ft/sec, (F) >2 ft/sec Velocity(meas.): _____ ft/sec

Riparian Vegetation: (both sides, does not need to add up to 100%

Riparian Width (ft):		Left: 100		Right: 50	(facing upstream)		
% Overstory:	Softwood	20	Hardwood	80			
% Understory:	Shrub (brush)	20	Grass	10	Herbaceous	20	(ferns)
% Canopy:	100, 90, 80, 70, 60, 50, 40, 30, 20, 10, 0			Overhead Canopy:	Open, Partly Open, or Closed		
	leaves mainly on						

Water Quality Parameters:		Sampler:		Meter (type, #):	
	Baseflow or Freshet	Present Flow:	H M-L	Annotate?:	
Temp Air (°F):	45	Temp Water (°C):	10.5		

General Observations (circle all 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, Black Rocks

B: Water Clarity: Clear, Slightly Turbid, Moderately Turbid, Very Turbid light stain

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, Blue-Gn

Aquatic Organisms Observed: Mussels, Crayfish, Gastropods, Fish, Other brook trout

Observations:

Pebble Count Field Form

River (site): West Branch Little River Site ID: 493238000075
River Mile: 7.5
Site Description: Upstream of Big Spruce Brook Confluence (MS-8)
Date: 9/22/2014

Periphyton Cover Observations

Moss Cover Index				
Category	0	1 (<5%)	2 (5-25%)	3 (>25%)
Observations	53	1	0	1

Macro-Algae Cover Index				
Category	0	1 (<5%)	2 (5-25%)	3 (>25%)
Observations	55	0	0	0

Micro-Algae Cover Index							
Category	0	1 (slimy)	2 (draw line)	3 (0.5-1mm)	4 (1-5 mm)	5 (5-20 mm)	6 (>20 mm)
Observations	5	50	0	0	0	0	0

Lotic Benthos Field Sheet

Site Name: WB 6.5

River (site):	West Branch Little River	River Mile:	6.5	Site ID:	493238000065	BioLab ID:	
Date:	9/22/2014	Time:	2:00pm	Crew :	C. Szal		
Site Description:	Above Pinnacle Brook (MS-14)						

Town:	Stowe	Stream Order:		Drainage Area (km2):	10	Elevation (ft):	1260
Latitude:	44.52	Longitude:	-72.7675	Lat/Long source (GPS,USGS Map, Datum):		USGS Map	
Weather:	cloudy			Flow/Weather Prev. (2 wks/2days):		Small event last week, light rain	
Surrounding Land Use:	resort, forest					last night	

Sampling Information:

Sampler:	C. Szal	Gear:	KN	Effort time (min)		Mesh (um)	500
Area (m^2)		Quantitative (Y/N):	N	# Reps:	2	Comp/rep	4

Periphyton Cover: For each type 0-100% (see separate page for Periphyton Cover Form)

Diatom:	90%	Filamentous Green:		and length (in):			
Blue Green:	Trace	Moss:	Trace	Green:		Other:	
General Trophic Rating:	1	(0=oligo, 5 = eutrophic)					

Embeddedness: (5) 0-5% Excel, (4) 5-25% V Good, (3) 25-50% Good, (2) 50-75% Fair, (1) >75% Poor

Silt rating (0-5):	2	CPOM rating (leaf packs) (0 - none to 5 - high):	3		
Lg Woody Debris (>4" dia) #:	0	/100m (reach)			

General Water Type:

Riffle	X	Winder		Other			
Warm		Cold		Mixed			
Channelized (Y/N):	N	US Dam (Y/N):	N	Other modifications:			
B.F. Width (ft)	40	Wetted Width (ft)	30	Riffle Depth (ft)	0.5	Pool Depth (ft)	1
Bank Stability:	EX, VG, G, F, P						
Velocity Range (Estimated):	(S) <0.4 ft/sec, (M) 0.4-2 ft/sec, (F) >2 ft/sec			Velocity(meas.):		ft/sec	

Riparian Vegetation: (both sides, does not need to add up to 100%

Riparian Width (ft):	Left:	>100	Right:	>100	(facing upstream)		
% Overstory:	Softwood	10	Hardwood	90			
% Understory:	Shrub (brush)	30	Grass		Herbaceous	20	(ferns)
% Canopy:	100, 90, 80, 70, 60, 50, 40, 30, 20, 10, 0			Overhead Canopy:	Open, Partly Open, or Closed		

Water Quality Parameters:

		Sampler:		Meter (type, #):	
Baseflow or Freshet		Present Flow:	H M-L	Annotate?:	
Temp Air (°F):	45	Temp Water (°C):	10.5		

General Observations (circle all that apply): Overall Aesthetic Rating 0 (poor) - 5 (exc.) 5

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

B: Water Clarity: Clear, Slightly Turbid, Moderately Turbid, Very Turbid

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, Blue-Gn

Aquatic Organisms Observed: Mussels, Crayfish, Gastropods, Fish, Other

Observations:

4' pool below confluence of Pinnacle

Pebble Count Field Form

River (site): West Branch Little River Site ID: 493238000065
River Mile: 6.5
Site Description: Above Pinnacle Brook (MS-14)
Date: 9/22/2014

Periphyton Cover Observations

Moss Cover Index				
Category	0	1 (<5%)	2 (5-25%)	3 (>25%)
Observations	46	0	0	0

Macro-Algae Cover Index				
Category	0	1 (<5%)	2 (5-25%)	3 (>25%)
Observations	46	0	0	0

Micro-Algae Cover Index							
Category	0	1 (slimy)	2 (draw line)	3 (0.5-1mm)	4 (1-5 mm)	5 (5-20 mm)	6 (>20 mm)
Observations	4	42	0	0	0	0	0

Lotic Benthos Field Sheet

Site Name: BS 0.3

River (site):	Big Spruce Brook	River Mile:	0.3	Site ID:	493238250003	BioLab ID:	
Date:	9/22/2014	Time:	9:15am	Crew :	C. Szal		
Site Description:	Below metal golf bridge, above footbridge, near gold clubhouse						
Town:	Stowe	Stream Order:		Drainage Area (km2):	1.9	Elevation (ft):	1470
Latitude:	44.52847	Longitude:	-72.77672	Lat/Long source (GPS,USGS Map, Datum):		USGS Map	
Weather:	light rain			Flow/Weather Prev. (2 wks/2days):		Small rainfall event 2 week	
Surrounding Land Use:	Resort, golf course, forest					Light rain last night	

Sampling Information:

Sampler:	C. Szal	Gear:	KN	Effort time (min)		Mesh (um)	500
Area (m^2)		Quantitative (Y/N):	N	# Reps:	1	Comp/rep	4

Periphyton Cover: For each type 0-100% (see separate page for Periphyton Cover Form)

Diatom:	70%	Filamentous Green:		and length (in):			
Blue Green:	Trace	Moss:	Trace	Green:		Other:	
General Trophic Rating:	1	(0=oligo, 5 = eutrophic)					

Embeddedness: (5) 0-5% Excel, (4) 5-25% V Good, (3) 25-50% Good, (2) 50-75% Fair, (1) >75% Poor

Silt rating (0-5):	4	CPOM rating (leaf packs) (0 - none to 5 - high):	1	leaves 90% on	
Lg Woody Debris (>4" dia) #:	0	/100m (reach)			

General Water Type:

Riffle	X	Winder		Other			
Warm		Cold		Mixed			
Channelized (Y/N):	Y	US Dam (Y/N):	N	Other modifications:			
B.F. Width (ft)	25	Wetted Width (ft)	10	Riffle Depth (ft)	0.17-0.33	Pool Depth (ft)	1

Bank Stability: EX, VG, (G), F, P

Velocity Range (Estimated): (S) <0.4 ft/sec, (M) 0.4-2 ft/sec, (F) >2 ft/sec Velocity(meas.): _____ ft/sec

Riparian Vegetation: (both sides, does not need to add up to 100%

Riparian Width (ft):		Left: 30		Right: 100	(facing upstream)		
% Overstory:	Softwood	20	Hardwood	80			
% Understory:	Shrub (brush)	30	Grass		Herbaceous	10	(ferns)
% Canopy:	100, 90, (80), 70, 60, 50, 40, 30, 20, 10, 0			Overhead Canopy:	Open, Partly Open, or (Closed)		

Water Quality Parameters:

		Sampler:		Meter (type, #):	
Baseflow or Freshet		Present Flow:	H- M- L	Annotate?:	
Temp Air (°F):	48	Temp Water (°C):	10.5		

General Observations (circle all 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, Black Rocks

B: Water Clarity: (Clear), Slightly Turbid, Moderately Turbid, Very Turbid

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, Blue-Gn

Aquatic Organisms Observed: Mussels, Crayfish, Gastropods, Fish, Other salamander

Observations:

Strong iron seep BL, several BL streambank seeps. Fe-P in stream

Pebble Count Field Form

River (site): Big Spruce Brook Site ID: 493238250003
River Mile: 0.3
Site Description: Below metal golf bridge, above footbridge, near golf clubhouse
Date: 9/22/2014

Periphyton Cover Observations

Moss Cover Index				
Category	0	1 (<5%)	2 (5-25%)	3 (>25%)
Observations	45	0	0	0

Macro-Algae Cover Index				
Category	0	1 (<5%)	2 (5-25%)	3 (>25%)
Observations	40	1	3	1

Micro-Algae Cover Index							
Category	0	1 (slimy)	2 (draw line)	3 (0.5-1mm)	4 (1-5 mm)	5 (5-20 mm)	6 (>20 mm)
Observations	3	40	2	0	0	0	0

Lotic Benthos Field Sheet

Site Name: BS 0.2

River (site):	Big Spruce Brook	River Mile:	0.2	Site ID:	493238250002	BioLab ID:	
Date:	9/22/2014	Time:	9:50am	Crew :	C. Szal		
Site Description:	Near confluence at former hostel (MS-10)						
Town:	Stowe	Stream Order:		Drainage Area (km2):	2	Elevation (ft):	1417
Latitude:	44.5266667	Longitude:	-72.7775	Lat/Long source (GPS,USGS Map, Datum):		USGS Map	
Weather:	light rain			Flow/Weather Prev. (2 wks/2days):		small events last 2 weeks	
Surrounding Land Use:	Resort, forest, golf course					light rain last 24 hour	

Sampling Information:

Sampler:	C. Szal	Gear:	KN	Effort time (min)		Mesh (um)	500
Area (m^2)		Quantitative (Y/N):	N	# Reps:	2	Comp/rep	4

Periphyton Cover: For each type 0-100% (see separate page for Periphyton Cover Form)

Diatom:	70%	Filamentous Green:		and length (in):			
Blue Green:	Trace	Moss:	Trace	Green:		Other:	
General Trophic Rating:	1	(0=oligo, 5 = eutrophic)					

Embeddedness: (5) 0-5% Excel, (4) 5-25% V Good, (3) 25-50% Good, (2) 50-75% Fair, (1) >75% Poor

Silt rating (0-5): 3-4 CPOM rating (leaf packs) (0 - none to 5 - high): 2

Lg Woody Debris (>4" dia) #: 0 /100m (reach)

General Water Type:

Riffle	X	Winder		Other			
Warm		Cold		Mixed			
Channelized (Y/N):	Y	US Dam (Y/N):	N	Other modifications:			
B.F. Width (ft)	30	Wetted Width (ft)	6-12	Riffle Depth (ft)	0.08-0.25	Pool Depth (ft)	NA

Bank Stability: EX, VG, G, F, P

Velocity Range (Estimated): (S) <0.4 ft/sec, (M) 0.4-2 ft/sec, (F) >2 ft/sec Velocity(meas.): ft/sec

Riparian Vegetation: (both sides, does not need to add up to 100%

Riparian Width (ft):		Left:	100	Right:	>100	(facing upstream)	
% Overstory:	Softwood	20	Hardwood	80			
% Understory:	Shrub (brush)	20	Grass		Herbaceous	20	
% Canopy:	100, 90, 80, 70, 60, 50, 40, 30, 20, 10, 0			Overhead Canopy:	Open, Partly Open, or Closed		

Water Quality Parameters: Sampler: Meter (type, #):

Baseflow or Freshet Present Flow: H M-L Annotate?:

Temp Air (°F): 48 Temp Water (°C): 10.5

General Observations (circle all 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, Black Rocks

B: Water Clarity: Clear, Slightly Turbid, Moderately Turbid, Very Turbid stain

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, Blue-Gn

Aquatic Organisms Observed: Mussels, Crayfish, Gastropods, Fish, Other salamander

Observations:

Silt layer on some cobbles; bank failure; black rocks

Pebble Count Field Form

River (site): Big Spruce Brook Site ID: 493238250002
River Mile: 0.2
Site Description: Near confluence at former hostel (MS-10)
Date: 9/22/2014

Periphyton Cover Observations

Moss Cover Index				
Category	0	1 (<5%)	2 (5-25%)	3 (>25%)
Observations	45	0	0	0

Macro-Algae Cover Index				
Category	0	1 (<5%)	2 (5-25%)	3 (>25%)
Observations	45	0	0	0

Micro-Algae Cover Index							
Category	0	1 (slimy)	2 (draw line)	3 (0.5-1mm)	4 (1-5 mm)	5 (5-20 mm)	6 (>20 mm)
Observations	0	42	3	0	0	0	0

Lotic Benthos Field Sheet

Site Name: PB 0.1

River (site):	Pinnacle Brook	River Mile:	0.1	Site ID:	493238240002	BioLab ID:	
Date:	9/22/2014	Time:	2:30pm	Crew :	C. Szal		
Site Description:	Approximately 100 feet upstream from the confluence with the West Branch (MS-13)						
Town:	Stowe	Stream Order:		Drainage Area (km2):	5.7	Elevation (ft):	1300
Latitude:	44.5205556	Longitude:	-72.7661111	Lat/Long source (GPS,USGS Map, Datum):		USGS Map	
Weather:	cloudy			Flow/Weather Prev. (2 wks/2days):		Small event last week, light rain	
Surrounding Land Use:	forest					last night	

Sampling Information:

Sampler:	C. Szal	Gear:	KN	Effort time (min)		Mesh (um)	500
Area (m^2)		Quantitative (Y/N):	N	# Reps:	2	Comp/rep	4

Periphyton Cover: For each type 0-100% (see separate page for Periphyton Cover Form)

Diatom:	85%	Filamentous Green:	Trace	and length (in):			
Blue Green:	10%	Moss:	5%	Green:		Other:	
General Trophic Rating:	1	(0=oligo, 5 = eutrophic)					

Embeddedness: (5) 0-5% Excel, (4) 5-25% V Good, (3) 25-50% Good, (2) 50-75% Fair, (1) >75% Poor

Silt rating (0-5):	1	CPOM rating (leaf packs) (0 - none to 5 - high):	4		
Lg Woody Debris (>4" dia) #:	0	/100m (reach)			

General Water Type:

Riffle	X	Winder		Other			
Warm		Cold		Mixed			
Channelized (Y/N):	N	US Dam (Y/N):	N	Other modifications:			
B.F. Width (ft)	30	Wetted Width (ft)	15-20	Riffle Depth (ft)	0.5	Pool Depth (ft)	3

Bank Stability: EX, VG, G, F, P 100-75%

Velocity Range (Estimated): (S) <0.4 ft/sec, (M) 0.4-2 ft/sec, (F) >2 ft/sec Velocity(meas.): _____ ft/sec

Riparian Vegetation: (both sides, does not need to add up to 100%

Riparian Width (ft):		Left:	>100	Right:	>100	(facing upstream)	
% Overstory:	Softwood	10	Hardwood	90			
% Understory:	Shrub (brush)	30	Grass		Herbaceous	20	(ferns)
% Canopy:	100, 90, 80, 70, 60, 50, 40, 30, 20, 10, 0			Overhead Canopy:	Open, Partly Open, or Closed		

Water Quality Parameters:

		Sampler:		Meter (type, #):	
Baseflow or Freshet		Present Flow:	H M-L	Annotate?:	
Temp Air (°F):	48	Temp Water (°C):	10.5		

General Observations (circle all that apply): Overall Aesthetic Rating 0 (poor) - 5 (exc.) 5

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

B: Water Clarity: Clear, Slightly Turbid, Moderately Turbid, Very Turbid

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, Blue-Gn

Aquatic Organisms Observed: Mussels, Crayfish, Gastropods, Fish, Other

Observations:

Pebble Count Field Form

River (site): Pinnacle Brook Site ID: 493238240002
River Mile: 0.1
Site Description: Approximately 100 feet upstream from the confluence with the West Branch (MS-13)
Date: 9/22/2014

Periphyton Cover Observations

Moss Cover Index				
Category	0	1 (<5%)	2 (5-25%)	3 (>25%)
Observations	44	12	2	0

Macro-Algae Cover Index				
Category	0	1 (<5%)	2 (5-25%)	3 (>25%)
Observations	56	1	1	0

Micro-Algae Cover Index							
Category	0	1 (slimy)	2 (draw line)	3 (0.5-1mm)	4 (1-5 mm)	5 (5-20 mm)	6 (>20 mm)
Observations	3	48	3	3	1	0	0

Stowe Resort-West Branch 8.8
Kick Net Results
22-Sep-14

Sampler: Catherine Szal
Taxonomist: Catherine Szal

ExpandedKey	Order	Family	SubFamilyOrTribe	GenusGroup	Genus	Species Group	Species	ORGANISMS/KICKNET KN-1	KN-2	Old BI	New BI	FFG
02.05.01.00.085.00.05	DIPTERA	CHIRONOMIDAE	CHIRONOMINI	N/A	POLYPEDILUM	N/A	aviceps	1.7		3	4	CG
02.05.03.02.121.00.00	DIPTERA	CHIRONOMIDAE	TANYTARSINI	MICROPSEC/TANYTARSUS	MICROPSECTRA	N/A	sp	25.7	12.0	3	6	CG
02.05.05.00.005.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	BRILLIA	N/A	sp	1.7	1.5	3	5	SRD
02.05.05.00.029.00.02	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	EUKIEFFERIELLA	N/A	brehmi grp	1.7		2	4	CG
02.05.05.00.068.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	PARACHAETOCLADIUS	N/A	sp		3.0	2	2	CG
02.05.05.00.075.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	PARAMETRIOCNEMUS	N/A	sp	49.7	31.5	3	5	CG
02.05.05.00.114.01.04	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	TVETENIA	bavarica grp	paucunca	44.6	21.0	2	4	CG
02.06.00.00.001.00.00	DIPTERA	DIXIDAE	N/A	N/A	DIXA	N/A	sp		1.5	2	I	CG
02.14.00.00.004.00.00	DIPTERA	SIMULIDAE	N/A	N/A	PROSIMULIUM	N/A	sp	5.1	21.0	I	2	CF
02.19.00.00.003.00.00	DIPTERA	TIPULIDAE	N/A	N/A	DICRANOTA	N/A	sp	12.0	16.5	2	3	PRD
02.19.00.00.006.00.00	DIPTERA	TIPULIDAE	N/A	N/A	HEXATOMA	N/A	sp	6.9	12.0	2	2	PRD
03.01.00.00.001.00.09	EPHEMEROPTERA	BAETIDAE	N/A	N/A	BAETIS	N/A	tricaudatus	56.6	51.0	3	6	CG
03.06.00.00.003.00.00	EPHEMEROPTERA	HEPTAGENIIDAE	N/A	N/A	EPEORUS	N/A	sp	15.4	13.5	0	0	CG
03.07.00.00.005.00.00	EPHEMEROPTERA	LEPTOPHLEBIIDAE	N/A	N/A	PARALEPTOPHLEBIA	N/A	sp	1.7		2	I	CG
04.01.00.00.003.00.00	TRICHOPTERA	BRACHYCENTRIDAE	N/A	N/A	MICRASEMA	N/A	sp		1.5	I	2	SHR
04.03.00.00.002.00.00	TRICHOPTERA	GLOSSOSOMATIDAE	N/A	N/A	GLOSSOSOMA	N/A	sp	18.9	9.0	I	0	SCR
04.05.01.00.006.00.01	TRICHOPTERA	HYDROPSYCHIDAE	ARCTOPSYCHINAE	N/A	PARAPSYCHE	N/A	apicalis	12.0	13.5	0	0	CF
04.07.00.00.001.00.00	TRICHOPTERA	LEPIDOSTOMATIDAE	N/A	N/A	LEPIDOSTOMA	N/A	sp	10.3	6.0	I	I	SRD
04.12.00.00.002.00.00	TRICHOPTERA	PHILOPOTAMIDAE	N/A	N/A	DOLOPHILODES	N/A	sp	1.7		0	0	CF
04.16.00.00.001.00.01	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	N/A	fuscula	1.7	3.0	I	2	PRD
04.16.00.00.001.00.19	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	N/A	brunnea	12.0	12.0	0	I	PRD
04.16.00.00.001.00.91	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	N/A	sp a	1.7	1.5	0	I	PRD
04.16.00.00.001.02.00	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	carolina/fenestra	carolina group	1.7	7.5	0	I	PRD
04.18.00.00.001.00.00	TRICHOPTERA	UENOIDAE	N/A	N/A	NEOPHYLAX	N/A	sp	1.7	1.5	2	3	SCR
05.02.00.00.006.00.00	PLECOPTERA	CHLOROPERLIDAE	N/A	N/A	SWELTSA	N/A	sp	109.7	90.0	0	0	PRD
05.02.00.00.091.00.00	PLECOPTERA	CHLOROPERLIDAE	N/A	N/A	GENUS A	N/A	sp	1.7	3.0	0	0	PRD
05.03.00.00.000.00.01	PLECOPTERA	LEUCTRIDAE	N/A	N/A	N/A	N/A	imm	130.3	97.5	0	0	SRD
05.04.00.00.001.00.00	PLECOPTERA	NEMOURIDAE	N/A	N/A	AMPHINEMURA	N/A	sp		1.5	0	2	SRD
05.07.00.00.006.00.00	PLECOPTERA	PERLODIDAE	N/A	N/A	ISOPERLA	N/A	sp	1.7		I	2	PRD
05.07.00.00.007.00.00	PLECOPTERA	PERLODIDAE	N/A	N/A	MALIREKUS	N/A	sp	20.6	15.0	I	2	PRD
05.08.00.00.001.00.02	PLECOPTERA	PTERONARCYIDAE	N/A	N/A	PTERONARCYS	N/A	proteus	1.7	1.5	I	0	SRD
18.04.00.00.000.00.00	OLIGOCHAETA	LUMBRICULIDAE	N/A	N/A	N/A	N/A	unid	1.7	3.0			CG
							TOTAL	552.0	451.5			

Stowe Resort-West Branch 8.0
Kick Net Results
22-Sep-14

Sampler: Catherine Szal
Taxonomist: Catherine Szal

ExpandedKey	Order	Family	SubFamilyOrTribe	GenusGroup	Genus	Species Group	Species	ORGANISMS/KICKNET KN-1	KN-2	Old BI	New BI	FFG
02.03.00.01.003.00.00	DIPTERA	CERATOPOGONIDAE	N/A	BEZZIA/PALPOMYIA	BEZZIA	N/A	sp		3.2	3	6	PRD
02.05.03.02.121.00.00	DIPTERA	CHIRONOMIDAE	TANYTARSINI	MICROPSEC/TANYTARSUS	MICROPSECTRA	N/A	sp	1.5	3.2	3	6	CG
02.05.05.00.005.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	BRILLIA	N/A	sp	1.5		3	5	SRD
02.05.05.00.018.00.91	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	CRICOTOPUS	N/A	sp a	1.5		4	7	SHR
02.05.05.00.029.00.08	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	EUKIEFFERIELLA	N/A	claripennis grp	1.5		3	8	CG
02.05.05.00.075.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	PARAMETRIOCNEMUS	N/A	sp	3	8	3	5	CG
02.05.05.00.114.00.01	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	TVETENIA	N/A	vitracies		1.6	3	6	CG
02.05.05.00.114.01.04	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	TVETENIA	bavarica grp	paucunca	4.5	6.4	2	4	CG
02.05.09.04.000.00.00	DIPTERA	CHIRONOMIDAE	PENTANEURINI	THIENEMANNIMYIA GROUP	N/A	N/A	group		3.2	3	6	PRD
02.08.00.00.000.00.00	DIPTERA	EMPIDIDAE	N/A	N/A	N/A	N/A	unid	1.5		3	6	PRD
02.14.00.00.005.00.00	DIPTERA	SIMULIDAE	N/A	N/A	SIMULIUM	N/A	sp	6		2	5	CF
02.19.00.00.003.00.00	DIPTERA	TIPULIDAE	N/A	N/A	DICRANOTA	N/A	sp	1.5	3.2	2	3	PRD
02.19.00.00.006.00.00	DIPTERA	TIPULIDAE	N/A	N/A	HEXATOMA	N/A	sp	9	17.6	2	2	PRD
02.19.00.00.014.00.00	DIPTERA	TIPULIDAE	N/A	N/A	PSEUDOLIMNOPHILA	N/A	sp	3		1	2	PRD
03.01.00.00.001.00.03	EPHEMEROPTERA	BAETIDAE	N/A	N/A	BAETIS	N/A	flavistriga	6	8	3	5	CG
03.01.00.00.001.00.09	EPHEMEROPTERA	BAETIDAE	N/A	N/A	BAETIS	N/A	tricaudatus	178.5	227.2	3	6	CG
03.01.00.02.006.00.01	EPHEMEROPTERA	BAETIDAE	N/A	ACENTRELLA/PLAUDITUS	ACENTRELLA	N/A	turbida	3		1	2	SCR
03.04.00.00.004.00.01	EPHEMEROPTERA	EPHEMERELLIDAE	N/A	N/A	EPHEMERELLA	N/A	aurivillii	3	3.2	0	0	CG
03.06.00.00.003.00.00	EPHEMEROPTERA	HEPTAGENIIDAE	N/A	N/A	EPEORUS	N/A	sp	6	6.4	0	0	CG
03.06.00.00.004.00.00	EPHEMEROPTERA	HEPTAGENIIDAE	N/A	N/A	HEPTAGENIA	N/A	sp		3.2	1	4	SCR
03.07.00.00.005.00.00	EPHEMEROPTERA	LEPTOPHLEBIIDAE	N/A	N/A	PARALEPTOPHLEBIA	N/A	sp		3.2	2	1	CG
04.01.00.00.003.00.00	TRICHOPTERA	BRACHYCENTRIDAE	N/A	N/A	MICRASEMA	N/A	sp		3.2	1	2	SHR
04.05.01.00.001.00.01	TRICHOPTERA	HYDROPSYCHIDAE	ARCTOPSYCHINAE	N/A	ARCTOPSYCHE	N/A	ladogensis	1.5	1.6	0	1	CF
04.05.01.00.006.00.01	TRICHOPTERA	HYDROPSYCHIDAE	ARCTOPSYCHINAE	N/A	PARAPSYCHE	N/A	apicalis	1.5	4.8	0	0	CF
04.07.00.00.001.00.00	TRICHOPTERA	LEPIDOSTOMATIDAE	N/A	N/A	LEPIDOSTOMA	N/A	sp	7.5	11.2	1	1	SRD
04.09.00.00.018.00.00	TRICHOPTERA	LIMNEPHILIDAE	N/A	N/A	PYCNOPSYCHE	N/A	sp	1.5		2	4	SRD
04.12.00.00.002.00.00	TRICHOPTERA	PHILOPOTAMIDAE	N/A	N/A	DOLOPHILODES	N/A	sp	6		0	0	CF
04.14.00.00.005.00.00	TRICHOPTERA	POLYCENTROPODIDAE	N/A	N/A	POLYCENTROPUS	N/A	sp	6	9.6	3	6	PRD
04.16.00.00.001.00.01	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	N/A	fuscula	9	3.2	1	2	PRD
04.16.00.00.001.02.00	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	carolina/fenestra	carolina group	1.5		0	1	PRD
05.01.00.00.000.00.01	PLECOPTERA	CAPNIIDAE	N/A	N/A	N/A	N/A	imm	1.5		1	3	SRD
05.02.00.00.006.00.00	PLECOPTERA	CHLOROPERLIDAE	N/A	N/A	SWELTSA	N/A	sp	61.5	44.8	0	0	PRD
05.02.00.00.091.00.00	PLECOPTERA	CHLOROPERLIDAE	N/A	N/A	GENUS A	N/A	sp		1.6	0	0	PRD
05.03.00.00.000.00.01	PLECOPTERA	LEUCTRIDAE	N/A	N/A	N/A	N/A	imm	39	30.4	0	0	SRD
05.04.00.00.000.00.01	PLECOPTERA	NEMOURIDAE	N/A	N/A	N/A	N/A	imm	1.5	1.6	1	2	SRD
05.05.00.00.000.00.01	PLECOPTERA	PELTOPERLIDAE	N/A	N/A	N/A	N/A	immature		6.4	1	0	SRD
05.07.00.00.006.00.00	PLECOPTERA	PERLODIDAE	N/A	N/A	ISOPERLA	N/A	sp	7.5	3.2	1	2	PRD
05.07.00.00.007.00.00	PLECOPTERA	PERLODIDAE	N/A	N/A	MALIREKUS	N/A	sp	22.5	16	1	2	PRD
18.04.00.00.000.00.00	OLIGOCHAETA	LUMBRICULIDAE	N/A	N/A	N/A	N/A	unid	54	46.4			CG
18.05.00.00.000.00.00	OLIGOCHAETA	ENCHYTRAEIDAE	N/A	N/A	N/A	N/A	unid		4.8			CG
							TOTAL	453.0	486.4			

Stowe Resort-West Branch 7.5
Kick Net Results
22-Sep-14

Sampler: Catherine Szal
Taxonomist: Catherine Szal

ExpandedKey	Order	Family	SubFamilyOrTribe	GenusGroup	Genus	Species Group	Species	ORGANISMS/KICKNET KN-1	KN-2	Old BI	New BI	FFG
02.01.00.00.001.00.00	DIPTERA	ATHERICIDAE	N/A	N/A	ATHERIX	N/A	sp		1.1	3	2	PRD
02.03.00.01.003.00.00	DIPTERA	CERATOPOGONIDAE	N/A	BEZZIA/PALPOMYIA	BEZZIA	N/A	sp	1.1		3	6	PRD
02.05.01.00.085.00.05	DIPTERA	CHIRONOMIDAE	CHIRONOMINI	N/A	POLYPEDILUM	N/A	aviceps	6.5	3.3	3	4	CG
02.05.03.02.121.00.00	DIPTERA	CHIRONOMIDAE	TANYTARSINI	MICROPSEC/TANYTARSUS	MICROPSECTRA	N/A	sp	2.2	6.5	3	6	CG
02.05.05.00.075.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	PARAMETRIOCNEMUS	N/A	sp	8.7	8.7	3	5	CG
02.05.05.00.096.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	RHEOCRICOTOPUS	N/A	sp		1.1	2	6	CG
02.05.05.00.114.01.04	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	TVETENIA	bavarica grp	paucunca	4.4	7.6	2	4	CG
02.05.09.04.000.00.00	DIPTERA	CHIRONOMIDAE	PENTANEURINI	THIENEMANNIMYIA GROUP	N/A	N/A	group	2.2		3	6	PRD
02.14.00.00.005.00.00	DIPTERA	SIMULIDAE	N/A	N/A	SIMULIUM	N/A	sp	1.1		2	5	CF
02.19.00.00.003.00.00	DIPTERA	TIPULIDAE	N/A	N/A	DICRANOTA	N/A	sp	5.5	5.5	2	3	PRD
02.19.00.00.006.00.00	DIPTERA	TIPULIDAE	N/A	N/A	HEXATOMA	N/A	sp	19.6	20.7	2	2	PRD
02.19.00.00.016.00.00	DIPTERA	TIPULIDAE	N/A	N/A	TIPULA	N/A	sp		1.1	3	6	SRD
03.01.00.00.001.00.03	EPHEMEROPTERA	BAETIDAE	N/A	N/A	BAETIS	N/A	flavistriga	3.3	1.1	3	5	CG
03.01.00.00.001.00.06	EPHEMEROPTERA	BAETIDAE	N/A	N/A	BAETIS	N/A	intercalaris	1.1		3	6	CG
03.01.00.00.001.00.09	EPHEMEROPTERA	BAETIDAE	N/A	N/A	BAETIS	N/A	tricaudatus	61.1	56.7	3	6	CG
03.04.00.00.004.00.01	EPHEMEROPTERA	EPHEMERELLIDAE	N/A	N/A	EPHEMERELLA	N/A	aurivillii	6.5	5.5	0	0	CG
03.06.00.00.003.00.00	EPHEMEROPTERA	HEPTAGENIIDAE	N/A	N/A	EPEORUS	N/A	sp	8.7	9.8	0	0	CG
03.06.00.00.004.00.00	EPHEMEROPTERA	HEPTAGENIIDAE	N/A	N/A	HEPTAGENIA	N/A	sp	1.1	2.2	1	4	SCR
04.01.00.00.003.00.00	TRICHOPTERA	BRACHYCENTRIDAE	N/A	N/A	MICRASEMA	N/A	sp	1.1		1	2	SHR
04.05.01.00.001.00.01	TRICHOPTERA	HYDROPSYCHIDAE	ARCTOPSYCHINAE	N/A	ARCTOPSYCHE	N/A	ladogensis	1.1	1.1	0	1	CF
04.07.00.00.001.00.00	TRICHOPTERA	LEPIDOSTOMATIDAE	N/A	N/A	LEPIDOSTOMA	N/A	sp	5.5	5.5	1	1	SRD
04.09.00.00.018.00.00	TRICHOPTERA	LIMNEPHILIDAE	N/A	N/A	PYCNOPSYCHE	N/A	sp	1.1		2	4	SRD
04.14.00.00.005.00.00	TRICHOPTERA	POLYCENTROPODIDAE	N/A	N/A	POLYCENTROPUS	N/A	sp	14.2	12.0	3	6	PRD
04.16.00.00.001.00.01	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	N/A	fuscula	5.5	7.6	1	2	PRD
04.16.00.00.001.00.91	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	N/A	sp a		1.1	0	1	PRD
04.16.00.00.001.02.00	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	carolina/fenestra	carolina group	1.1	1.1	0	1	PRD
04.18.00.00.001.00.00	TRICHOPTERA	UENOIDAE	N/A	N/A	NEOPHYLAX	N/A	sp	1.1		2	3	SCR
05.02.00.00.006.00.00	PLECOPTERA	CHLOROPERLIDAE	N/A	N/A	SWELTSA	N/A	sp	101.5	125.5	0	0	PRD
05.02.00.00.091.00.00	PLECOPTERA	CHLOROPERLIDAE	N/A	N/A	GENUS A	N/A	sp	3.3	4.4	0	0	PRD
05.03.00.00.000.00.01	PLECOPTERA	LEUCTRIDAE	N/A	N/A	N/A	N/A	imm	30.5	24.0	0	0	SRD
05.05.00.00.000.00.01	PLECOPTERA	PELTOPERLIDAE	N/A	N/A	N/A	N/A	immature	1.1	1.1	1	0	SRD
05.07.00.00.006.00.00	PLECOPTERA	PERLODIDAE	N/A	N/A	ISOPERLA	N/A	sp		1.1	1	2	PRD
05.07.00.00.007.00.00	PLECOPTERA	PERLODIDAE	N/A	N/A	MALIREKUS	N/A	sp	7.6	4.4	1	2	PRD
05.08.00.00.001.00.02	PLECOPTERA	PTERONARCYIDAE	N/A	N/A	PTERONARCYS	N/A	proteus		1.1	1	0	SRD
12.08.00.00.002.00.00	GASTROPODA	PHYSIDAE	N/A	N/A	PHYSA	N/A	sp		1.1	4	8	CG
13.02.00.00.002.00.00	BIVALVIA	SPHAERIIDAE	N/A	N/A	PISIDIUM	N/A	sp		1.1	4	8	CF
18.04.00.00.000.00.00	OLIGOCHAETA	LUMBRICULIDAE	N/A	N/A	N/A	N/A	unid	27.3	30.5			CG
							TOTAL	334.9	353.5			

Stowe Resort-West Branch 6.5
Kick Net Results
22-Sep-14

Sampler: Catherine Szal
Taxonomist: Catherine Szal

ExpandedKey	Order	Family	SubFamilyOrTribe	GenusGroup	Genus	Species Group	Species	ORGANISMS/KICKNET KN-1	KN-2	Old BI	New BI	FFG
02.05.01.00.085.00.05	DIPTERA	CHIRONOMIDAE	CHIRONOMINI	N/A	POLYPEDILUM	N/A	aviceps	2.3	13.7	3	4	CG
02.05.03.02.121.00.00	DIPTERA	CHIRONOMIDAE	TANYTARSINI	MICROPSEC/TANYTARSUS	MICROPSECTRA	N/A	sp	2.3		3	6	CG
02.05.05.00.005.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	BRILLIA	N/A	sp	2.3		3	5	SRD
02.05.05.00.029.00.02	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	EUKIEFFERIELLA	N/A	brehmi grp	1.1		2	4	CG
02.05.05.00.068.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	PARACHAETOCLADIUS	N/A	sp		1.1	2	2	CG
02.05.05.00.075.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	PARAMETRIOCNEMUS	N/A	sp	1.1	8.0	3	5	CG
02.05.05.00.096.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	RHEOCRICOTOPUS	N/A	sp		1.1	2	6	CG
02.05.05.00.109.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	THIENEMANNIELLA	N/A	sp		1.1	2	5	CG
02.05.05.00.114.00.01	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	TVETENIA	N/A	vitracies	1.1	1.1	3	6	CG
02.05.05.00.114.01.04	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	TVETENIA	bavarica grp	paucunca	2.3	8.0	2	4	CG
02.14.00.00.005.00.00	DIPTERA	SIMULIDAE	N/A	N/A	SIMULIUM	N/A	sp		1.1	2	5	CF
02.19.00.00.003.00.00	DIPTERA	TIPULIDAE	N/A	N/A	DICRANOTA	N/A	sp	1.1	4.6	2	3	PRD
02.19.00.00.006.00.00	DIPTERA	TIPULIDAE	N/A	N/A	HEXATOMA	N/A	sp	3.4	6.9	2	2	PRD
02.19.00.00.016.00.00	DIPTERA	TIPULIDAE	N/A	N/A	TIPULA	N/A	sp		1.1	3	6	SRD
03.01.00.00.001.00.03	EPHEMEROPTERA	BAETIDAE	N/A	N/A	BAETIS	N/A	flavistriga	17.1	6.9	3	5	CG
03.01.00.00.001.00.06	EPHEMEROPTERA	BAETIDAE	N/A	N/A	BAETIS	N/A	intercalaris	2.3		3	6	CG
03.01.00.00.001.00.09	EPHEMEROPTERA	BAETIDAE	N/A	N/A	BAETIS	N/A	tricaudatus	121.1	102.9	3	6	CG
03.01.00.02.006.00.01	EPHEMEROPTERA	BAETIDAE	N/A	ACENTRELLA/PLAUDITUS	ACENTRELLA	N/A	turbida		1.1	I	2	SCR
03.01.00.02.007.00.00	EPHEMEROPTERA	BAETIDAE	N/A	ACENTRELLA/PLAUDITUS	PLAUDITUS	N/A	sp	2.3	13.7	2	5	SCR
03.04.00.00.004.00.01	EPHEMEROPTERA	EPHEMERELLIDAE	N/A	N/A	EPHEMERELLA	N/A	aurivillii	2.3	11.4	0	0	CG
03.04.00.00.004.01.00	EPHEMEROPTERA	EPHEMERELLIDAE	N/A	N/A	EPHEMERELLA	subv/inv/rotund	group		2.3	2	4	CG
03.06.00.00.003.00.00	EPHEMEROPTERA	HEPTAGENIIDAE	N/A	N/A	EPEORUS	N/A	sp	32.0	24.0	0	0	CG
03.06.00.00.004.00.00	EPHEMEROPTERA	HEPTAGENIIDAE	N/A	N/A	HEPTAGENIA	N/A	sp	25.1	19.4	I	4	SCR
03.07.00.00.005.00.00	EPHEMEROPTERA	LEPTOPHLEBIIDAE	N/A	N/A	PARALEPTOPHLEBIA	N/A	sp	1.1		2	I	CG
04.05.00.02.008.01.04	TRICHOPTERA	HYDROPSYCHIDAE	N/A	CERATOPSYC/HYDROPSYC	CERATOPSYCHE	alh/slo/spa	alhedra	2.3	3.4	2	3	CF
04.05.00.02.008.01.07	TRICHOPTERA	HYDROPSYCHIDAE	N/A	CERATOPSYC/HYDROPSYC	CERATOPSYCHE	alh/slo/spa	sparna	2.3	1.1	2	4	CF
04.05.01.00.001.00.01	TRICHOPTERA	HYDROPSYCHIDAE	ARCTOPSYCHINAE	N/A	ARCTOPSYCHE	N/A	ladogensis	14.9	16.0	0	I	CF
04.07.00.00.001.00.00	TRICHOPTERA	LEPIDOSTOMATIDAE	N/A	N/A	LEPIDOSTOMA	N/A	sp	16.0	12.6	I	I	SRD
04.14.00.00.005.00.00	TRICHOPTERA	POLYCENTROPODIDAE	N/A	N/A	POLYCENTROPUS	N/A	sp	5.7	1.1	3	6	PRD
04.16.00.00.001.00.01	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	N/A	fuscula	5.7	4.6	I	2	PRD
04.16.00.00.001.00.91	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	N/A	sp a	1.1	1.1	0	I	PRD
04.16.00.00.001.02.00	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	carolina/fenestra	carolina group	1.1		0	I	PRD
05.02.00.00.006.00.00	PLECOPTERA	CHLOROPERLIDAE	N/A	N/A	SWELTSA	N/A	sp	44.6	66.3	0	0	PRD
05.02.00.00.091.00.00	PLECOPTERA	CHLOROPERLIDAE	N/A	N/A	GENUS A	N/A	sp	4.6	2.3	0	0	PRD
05.03.00.00.000.00.01	PLECOPTERA	LEUCTRIDAE	N/A	N/A	N/A	N/A	imm	9.1	8.0	0	0	SRD
05.05.00.00.000.00.01	PLECOPTERA	PELTOPERLIDAE	N/A	N/A	N/A	N/A	immature	2.3		I	0	SRD
05.06.00.00.004.00.01	PLECOPTERA	PERLIDAE	N/A	N/A	PARAGNETINA	N/A	media		1.1	I	I	PRD
05.06.00.00.007.00.01	PLECOPTERA	PERLIDAE	N/A	N/A	AGNETINA	N/A	capitata		2.3	0	2	PRD
05.07.00.00.007.00.00	PLECOPTERA	PERLODIDAE	N/A	N/A	MALIREKUS	N/A	sp	3.4	3.4	I	2	PRD
05.08.00.00.001.00.02	PLECOPTERA	PTERONARCYIDAE	N/A	N/A	PTERONARCYS	N/A	proteus		3.4	I	0	SRD
06.06.00.00.007.00.00	ODONATA	GOMPHIDAE	N/A	N/A	LANTHUS	N/A	sp		1.1	2	5	PRD
18.04.00.00.000.00.00	OLIGOCHAETA	LUMBRICULIDAE	N/A	N/A	N/A	N/A	unid	14.9	2.3			CG
							TOTAL	348.6	360.0			

Stowe Resort-Big Spruce RM 0.3
Kick Net Results
22-Sep-14

Sampler: Catherine Szal
Taxonomist: Catherine Szal

								ORGANISMS/KICKNET				
ExpandedKey	Order	Family	SubFamilyOrTribe	GenusGroup	Genus	Species Group	Species	KN-1	KN-2	Old BI	New BI	FFG
02.05.01.00.055.00.00	DIPTERA	CHIRONOMIDAE	CHIRONOMINI	N/A	MICROTENDIPES	N/A	sp	1		3	6	CG
02.05.01.00.085.00.05	DIPTERA	CHIRONOMIDAE	CHIRONOMINI	N/A	POLYPEDILUM	N/A	aviceps	4		3	4	CG
02.05.03.02.121.00.00	DIPTERA	CHIRONOMIDAE	TANYTARSINI	MICROPSEC/TANYTARSUS	MICROPSECTRA	N/A	sp	1		3	6	CG
02.05.05.00.068.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	PARACHAETOCLADIUS	N/A	sp	15		2	2	CG
02.05.05.00.075.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	PARAMETRIOCNEMUS	N/A	sp	11		3	5	CG
02.05.05.00.114.01.04	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	TVETENIA	bavarica grp	paucunca	2		2	4	CG
02.05.09.04.000.00.00	DIPTERA	CHIRONOMIDAE	PENTANEURINI	THIENEMANNIMYIA GROUP	N/A	N/A	group	2		3	6	PRD
02.06.00.00.001.00.00	DIPTERA	DIXIDAE	N/A	N/A	DIXA	N/A	sp	1		2	1	CG
02.19.00.00.003.00.00	DIPTERA	TIPULIDAE	N/A	N/A	DICRANOTA	N/A	sp	3		2	3	PRD
02.19.00.00.006.00.00	DIPTERA	TIPULIDAE	N/A	N/A	HEXATOMA	N/A	sp	14		2	2	PRD
02.19.00.00.014.00.00	DIPTERA	TIPULIDAE	N/A	N/A	PSEUDOLIMNOPHILA	N/A	sp	1		1	2	PRD
03.01.00.00.001.00.09	EPHEMEROPTERA	BAETIDAE	N/A	N/A	BAETIS	N/A	tricaudatus	1		3	6	CG
04.05.01.00.006.00.01	TRICHOPTERA	HYDROPSYCHIDAE	ARCTOPSYCHINAE	N/A	PARAPSYCHE	N/A	apicalis	1		0	0	CF
04.07.00.00.001.00.00	TRICHOPTERA	LEPIDOSTOMATIDAE	N/A	N/A	LEPIDOSTOMA	N/A	sp	2		1	1	SRD
04.16.00.00.001.00.01	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	N/A	fuscula	2		1	2	PRD
04.16.00.00.001.00.91	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	N/A	sp a	1		0	1	PRD
04.18.00.00.001.00.00	TRICHOPTERA	UENOIDAE	N/A	N/A	NEOPHYLAX	N/A	sp	2		2	3	SCR
05.01.00.00.000.00.01	PLECOPTERA	CAPNIIDAE	N/A	N/A	N/A	N/A	imm	4		1	3	SRD
05.02.00.00.006.00.00	PLECOPTERA	CHLOROPERLIDAE	N/A	N/A	SWELTSA	N/A	sp	32		0	0	PRD
05.02.00.00.091.00.00	PLECOPTERA	CHLOROPERLIDAE	N/A	N/A	GENUS A	N/A	sp	1		0	0	PRD
05.03.00.00.000.00.01	PLECOPTERA	LEUCTRIDAE	N/A	N/A	N/A	N/A	imm	21		0	0	SRD
05.07.00.00.007.00.00	PLECOPTERA	PERLODIDAE	N/A	N/A	MALIREKUS	N/A	sp	2		1	2	PRD
07.02.00.00.001.00.00	MEGALOPTERA	SIALIDAE	N/A	N/A	SIALIS	N/A	sp	1		3	6	PRD
18.04.00.00.000.00.00	OLIGOCHAETA	LUMBRICULIDAE	N/A	N/A	N/A	N/A	unid	6				CG
18.05.00.00.000.00.00	OLIGOCHAETA	ENCHYTRAEIDAE	N/A	N/A	N/A	N/A	unid	1				CG
							TOTAL	132.0				

Stowe Resort-Big Spruce RM 0.2
Kick Net Results
22-Sep-14

Sampler: Catherine Szal
Taxonomist: Catherine Szal

								ORGANISMS/KICKNET				
ExpandedKey	Order	Family	SubFamilyOrTribe	GenusGroup	Genus	Species Group	Species	KN-1	KN-2	Old Bl	New Bl	FFG
01.03.00.00.006.00.01	COLEOPTERA	ELMIDAE	N/A	N/A	OULIMNIUS	N/A	latiusculus	2	1	2	3	SCR
02.05.01.00.085.00.05	DIPTERA	CHIRONOMIDAE	CHIRONOMINI	N/A	POLYPEDILUM	N/A	aviceps	3	2	3	4	CG
02.05.05.00.005.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	BRILLIA	N/A	sp		4	3	5	SRD
02.05.05.00.068.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	PARACHAETOCLADIUS	N/A	sp	8	9	2	2	CG
02.05.05.00.075.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	PARAMETRIOCNEMUS	N/A	sp	6	15	3	5	CG
02.05.05.00.109.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	THIENEMANNIELLA	N/A	sp	1	3	2	5	CG
02.05.05.00.114.01.04	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	TVETENIA	bavarica grp	paucunca	3	7	2	4	CG
02.05.09.04.000.00.00	DIPTERA	CHIRONOMIDAE	PENTANEURINI	THIENEMANNIMYIA GROUP	N/A	N/A	group	1	2	3	6	PRD
02.19.00.00.001.00.00	DIPTERA	TIPULIDAE	N/A	N/A	ANTOCHA	N/A	sp		1	3	4	CG
02.19.00.00.003.00.00	DIPTERA	TIPULIDAE	N/A	N/A	DICRANOTA	N/A	sp	1	4	2	3	PRD
02.19.00.00.006.00.00	DIPTERA	TIPULIDAE	N/A	N/A	HEXATOMA	N/A	sp	5	15	2	2	PRD
02.19.00.00.014.00.00	DIPTERA	TIPULIDAE	N/A	N/A	PSEUDOLIMNOPHILA	N/A	sp	1		1	2	PRD
02.19.00.00.016.00.00	DIPTERA	TIPULIDAE	N/A	N/A	TIPULA	N/A	sp	2	5	3	6	SRD
03.01.00.00.001.00.09	EPHEMEROPTERA	BAETIDAE	N/A	N/A	BAETIS	N/A	tricaudatus	9	12	3	6	CG
03.01.00.02.007.00.00	EPHEMEROPTERA	BAETIDAE	N/A	ACENTRELLA/PLAUDITUS	PLAUDITUS	N/A	sp		1	2	5	SCR
03.06.00.00.004.00.00	EPHEMEROPTERA	HEPTAGENIIDAE	N/A	N/A	HEPTAGENIA	N/A	sp	1		1	4	SCR
04.05.00.00.003.00.01	TRICHOPTERA	HYDROPSYCHIDAE	N/A	N/A	DIPLECTRONA	N/A	modesta	6	8	0	0	CF
04.05.00.02.008.01.04	TRICHOPTERA	HYDROPSYCHIDAE	N/A	CERATOPSYC/HYDROPSYC	CERATOPSYCHE	alh/slo/spa	alhedra	1	1	2	3	CF
04.05.00.02.008.01.07	TRICHOPTERA	HYDROPSYCHIDAE	N/A	CERATOPSYC/HYDROPSYC	CERATOPSYCHE	alh/slo/spa	sparna		1	2	4	CF
04.05.01.00.001.00.01	TRICHOPTERA	HYDROPSYCHIDAE	ARCTOPSYCHINAE	N/A	ARCTOPSYCHE	N/A	ladogensis	2		0	1	CF
04.05.01.00.006.00.01	TRICHOPTERA	HYDROPSYCHIDAE	ARCTOPSYCHINAE	N/A	PARAPSYCHE	N/A	apicalis	2	1	0	0	CF
04.07.00.00.001.00.00	TRICHOPTERA	LEPIDOSTOMATIDAE	N/A	N/A	LEPIDOSTOMA	N/A	sp	1	2	1	1	SRD
04.11.00.00.001.00.00	TRICHOPTERA	ODONTOCERIDAE	N/A	N/A	PSILOTRETA	N/A	sp		1	0	0	SCR
04.14.00.00.005.00.00	TRICHOPTERA	POLYCENTROPODIDAE	N/A	N/A	POLYCENTROPUS	N/A	sp	3	1	3	6	PRD
04.16.00.00.001.00.01	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	N/A	fuscula		4	1	2	PRD
04.16.00.00.001.00.91	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	N/A	sp a		2	0	1	PRD
04.16.00.00.001.02.00	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	carolina/fenestra	carolina group		1	0	1	PRD
04.20.00.00.001.00.00	TRICHOPTERA	APATANIIDAE	N/A	N/A	APATANIA	N/A	sp	1		1	3	SCR
05.01.00.00.000.00.01	PLECOPTERA	CAPNIIDAE	N/A	N/A	N/A	N/A	imm	2		1	3	SRD
05.02.00.00.006.00.00	PLECOPTERA	CHLOROPERLIDAE	N/A	N/A	SWELTSA	N/A	sp	44	60	0	0	PRD
05.03.00.00.000.00.01	PLECOPTERA	LEUCTRIDAE	N/A	N/A	N/A	N/A	imm	7	7	0	0	SRD
05.07.00.00.006.00.00	PLECOPTERA	PERLODIDAE	N/A	N/A	ISOPERLA	N/A	sp	1		1	2	PRD
05.07.00.00.007.00.00	PLECOPTERA	PERLODIDAE	N/A	N/A	MALIREKUS	N/A	sp	10	2	1	2	PRD
07.02.00.00.001.00.00	MEGALOPTERA	SIALIDAE	N/A	N/A	SIALIS	N/A	sp	3		3	6	PRD
18.04.00.00.000.00.00	OLIGOCHAETA	LUMBRICULIDAE	N/A	N/A	N/A	N/A	unid	3	4			CG
18.05.00.00.000.00.00	OLIGOCHAETA	ENCHYTRAEIDAE	N/A	N/A	N/A	N/A	unid	1				CG
18.06.00.00.000.00.00	OLIGOCHAETA	LUMBRICINA	N/A	N/A	N/A	N/A	unid		1			CG
							TOTAL	130.0	177.0			

Stowe Resort-Pinnacle Brook RM 0.1
Kick Net Results
22-Sep-14

Sampler: Catherine Szal
Taxonomist: Catherine Szal

								ORGANISMS/KICKNET				
ExpandedKey	Order	Family	SubFamilyOrTribe	GenusGroup	Genus	Species Group	Species	KN-1	KN-2	Old BI	New BI	FFG
01.03.00.00.006.00.01	COLEOPTERA	ELMIDAE	N/A	N/A	OULIMNIUS	N/A	latiusculus	1.1	5.1	2	3	SCR
02.01.00.00.001.00.00	DIPTERA	ATHERICIDAE	N/A	N/A	ATHERIX	N/A	sp	3.3		3	2	PRD
02.05.01.00.055.00.00	DIPTERA	CHIRONOMIDAE	CHIRONOMINI	N/A	MICROTENDIPES	N/A	sp	6.5	2.5	3	6	CG
02.05.01.00.085.00.05	DIPTERA	CHIRONOMIDAE	CHIRONOMINI	N/A	POLYPEDILUM	N/A	aviceps	33.8	51.8	3	4	CG
02.05.03.02.121.00.00	DIPTERA	CHIRONOMIDAE	TANYTARSINI	MICROPSEC/TANYTARSUS	MICROPSECTRA	N/A	sp	3.3	3.8	3	6	CG
02.05.05.00.005.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	BRILLIA	N/A	sp	1.1		3	5	SRD
02.05.05.00.068.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	PARACHAETOCLADIUS	N/A	sp		1.3	2	2	CG
02.05.05.00.075.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	PARAMETRIOCNEMUS	N/A	sp	20.7	46.7	3	5	CG
02.05.05.00.096.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	RHEOCRICOTOPUS	N/A	sp		1.3	2	6	CG
02.05.05.00.109.00.00	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	THIENEMANNIELLA	N/A	sp	3.3	3.8	2	5	CG
02.05.05.00.114.01.04	DIPTERA	CHIRONOMIDAE	ORTHOCLADIINAE	N/A	TVETENIA	bavarica grp	paucunca	25.1	34.1	2	4	CG
02.05.09.04.000.00.00	DIPTERA	CHIRONOMIDAE	PENTANEURINI	THIENEMANNIMYIA GROUP	N/A	N/A	group	2.2	3.8	3	6	PRD
02.14.00.00.004.00.00	DIPTERA	SIMULIDAE	N/A	N/A	PROSIMULIUM	N/A	sp	4.4		I	2	CF
02.19.00.00.003.00.00	DIPTERA	TIPULIDAE	N/A	N/A	DICRANOTA	N/A	sp	6.5	2.5	2	3	PRD
02.19.00.00.006.00.00	DIPTERA	TIPULIDAE	N/A	N/A	HEXATOMA	N/A	sp	3.3	1.3	2	2	PRD
02.19.00.00.016.00.00	DIPTERA	TIPULIDAE	N/A	N/A	TIPULA	N/A	sp		3.8	3	6	SRD
03.01.00.00.001.00.09	EPHEMEROPTERA	BAETIDAE	N/A	N/A	BAETIS	N/A	tricaudatus	34.9	35.4	3	6	CG
03.04.00.00.005.00.02	EPHEMEROPTERA	EPHEMERELLIDAE	N/A	N/A	EURYLOPHELLA	N/A	funeralis		2.5	I	0	SRD
03.06.00.00.003.00.00	EPHEMEROPTERA	HEPTAGENIIDAE	N/A	N/A	EPEORUS	N/A	sp	15.3	10.1	0	0	CG
04.01.00.00.003.00.00	TRICHOPTERA	BRACHYCENTRIDAE	N/A	N/A	MICRASEMA	N/A	sp		1.3	I	2	SHR
04.03.00.00.002.00.00	TRICHOPTERA	GLOSSOSOMATIDAE	N/A	N/A	GLOSSOSOMA	N/A	sp	2.2		I	0	SCR
04.05.00.00.003.00.01	TRICHOPTERA	HYDROPSYCHIDAE	N/A	N/A	DIPLECTRONA	N/A	modesta	1.1		0	0	CF
04.05.00.02.008.01.04	TRICHOPTERA	HYDROPSYCHIDAE	N/A	CERATOPSYC/HYDROPSYC	CERATOPSYCHE	alh/slo/spa	alhedra		5.1	2	3	CF
04.05.00.02.008.01.07	TRICHOPTERA	HYDROPSYCHIDAE	N/A	CERATOPSYC/HYDROPSYC	CERATOPSYCHE	alh/slo/spa	sparna	2.2		2	4	CF
04.05.01.00.001.00.01	TRICHOPTERA	HYDROPSYCHIDAE	ARCTOPSYCHINAE	N/A	ARCTOPSYCHE	N/A	ladogensis		1.3	0	I	CF
04.05.01.00.006.00.01	TRICHOPTERA	HYDROPSYCHIDAE	ARCTOPSYCHINAE	N/A	PARAPSYCHE	N/A	apicalis	1.1	1.3	0	0	CF
04.07.00.00.001.00.00	TRICHOPTERA	LEPIDOSTOMATIDAE	N/A	N/A	LEPIDOSTOMA	N/A	sp	3.3	10.1	I	I	SRD
04.12.00.00.002.00.00	TRICHOPTERA	PHILOPOTAMIDAE	N/A	N/A	DOLOPHILODES	N/A	sp	8.7	25.3	0	0	CF
04.14.00.00.005.00.00	TRICHOPTERA	POLYCENTROPODIDAE	N/A	N/A	POLYCENTROPUS	N/A	sp	2.2	2.5	3	6	PRD
04.16.00.00.001.00.01	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	N/A	fuscula	9.8	15.2	I	2	PRD
04.16.00.00.001.00.19	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	N/A	brunnea	1.1		0	I	PRD
04.16.00.00.001.02.00	TRICHOPTERA	RHYACOPHILIDAE	N/A	N/A	RHYACOPHILA	carolina/fenestra	carolina group	1.1	1.3	0	I	PRD
04.18.00.00.001.00.00	TRICHOPTERA	UENOIDAE	N/A	N/A	NEOPHYLAX	N/A	sp	4.4	1.3	2	3	SCR
04.20.00.00.001.00.00	TRICHOPTERA	APATANIIDAE	N/A	N/A	APATANIA	N/A	sp	1.1		I	3	SCR
05.01.00.00.000.00.01	PLECOPTERA	CAPNIIDAE	N/A	N/A	N/A	N/A	imm	5.5	6.3	I	3	SRD
05.02.00.00.006.00.00	PLECOPTERA	CHLOROPERLIDAE	N/A	N/A	SWELTSA	N/A	sp	101.5	136.4	0	0	PRD
05.02.00.00.091.00.00	PLECOPTERA	CHLOROPERLIDAE	N/A	N/A	GENUS A	N/A	sp	3.3	5.1	0	0	PRD
05.03.00.00.000.00.01	PLECOPTERA	LEUCTRIDAE	N/A	N/A	N/A	N/A	imm	37.1	35.4	0	0	SRD
05.05.00.00.000.00.01	PLECOPTERA	PELTOPERLIDAE	N/A	N/A	N/A	N/A	immature	10.9	15.2	I	0	SRD
05.06.00.00.007.00.01	PLECOPTERA	PERLIDAE	N/A	N/A	AGNETINA	N/A	capitata		1.3	0	2	PRD
05.07.00.00.006.00.00	PLECOPTERA	PERLODIDAE	N/A	N/A	ISOPERLA	N/A	sp	1.1	1.3	I	2	PRD
05.07.00.00.007.00.00	PLECOPTERA	PERLODIDAE	N/A	N/A	MALIREKUS	N/A	sp	1.1	5.1	I	2	PRD
06.06.00.00.007.00.00	ODONATA	GOMPHIDAE	N/A	N/A	LANTHUS	N/A	sp	1.1		2	5	PRD
18.04.00.00.000.00.00	OLIGOCHAETA	LUMBRICULIDAE	N/A	N/A	N/A	N/A	unid	3.3	5.1			CG
							TOTAL	367.6	485.1			

Stowe Resort-West Branch 8.8
Kick Net Results - Both Replicates
September 22, 2014

	Rep. #1	Rep. #2	Average
Community Metrics:			
Density/Unit	552.0	451.5	501.8
Species Richness	28	27	27.5
EPT Richness	18	17	17.5
Bio Index (old)	1.10	1.02	1.06
Bio Index (new)	1.97	1.84	1.90
% dominant taxa	23.6	21.6	22.6
EPT/EPT+C	0.76	0.83	0.79
EPT/Richness	0.64	0.63	0.64
% Model Affinity (orders)	64.8	67.1	66.0
PPCS - functional groups	0.43	0.51	0.47
Major Groups:			
Coleoptera	0.0	0.0	0.0
Diptera (%)	27.0	26.6	26.8
Ephemeroptera (%)	13.4	14.3	13.8
Trichoptera (%)	11.2	12.3	11.7
Plecoptera (%)	48.1	46.2	47.2
Oligochaeta (%)	0.3	0.7	0.5
Bivalvia (%)	0.0	0.0	0.0
Megaloptera (%)	0.0	0.0	0.0
Odonata (%)	0.0	0.0	0.0
Other (%)	0.0	0.0	0.0
Total (%)	100.0	100.0	100.0
Feeding Groups:			
Collector Gatherer (%)	36.0	30.2	33.1
Collector Filterer (%)	3.4	7.6	5.5
Predator (%)	30.7	35.5	33.1
Shredder - Detritus (%)	26.1	23.9	25.0
Shredder - Herbivore (%)	0.0	0.3	0.2
Scraper (%)	3.7	2.3	3.0
Total (%)	100.0	100.0	100.0

Stowe Resort-West Branch 8.8
Kick Net Results - Both Replicates
September 22, 2014

APPLICATION OF PROPOSED STATE OF VERMONT BIOCRITERIA (2/12/02)

Metric	Value	ANR Scoring Guidelines for SHG		
		B2-3	B1	A1
Density	501.8	Pass	Pass	Indet.
Richness	27.5	Indet.+	Fail	Fail
EPT	17.5	Pass	Indet.-	Fail
PMA-O	66.0	Pass	Pass	Indet.+
BI	1.90	Pass	Pass	Pass
%Oligo	0.5	Pass	Pass	Pass
EPT/EPT+C	0.79	Pass	Pass	Pass
PPCS-FG	0.47	Pass	Indet.+	Indet.-
Outcome:	Meets Class B2-3			

Stowe Resort-West Branch 8.0
Kick Net Results - Both Replicates
September 22, 2014

	Rep. #1	Rep. #2	Average
Community Metrics:			
Density/Unit	453.0	486.4	469.7
Species Richness	31	29	30.0
EPT Richness	19	19	19.0
Bio Index (old)	1.77	2.07	1.92
Bio Index (new)	3.47	3.96	3.71
% dominant taxa	39.4	46.7	43.1
EPT/EPT+C	0.96	0.95	0.95
EPT/Richness	0.61	0.66	0.63
% Model Affinity (orders)	59.7	60.9	60.3
PPCS - functional groups	0.43	0.47	0.45
Major Groups:			
Coleoptera	0.0	0.0	0.0
Diptera (%)	7.6	9.5	8.6
Ephemeroptera (%)	43.4	51.6	47.5
Trichoptera (%)	7.6	6.9	7.3
Plecoptera (%)	29.5	21.4	25.4
Oligochaeta (%)	11.9	10.5	11.2
Bivalvia (%)	0.0	0.0	0.0
Megaloptera (%)	0.0	0.0	0.0
Odonata (%)	0.0	0.0	0.0
Other (%)	0.0	0.0	0.0
Total (%)	100.0	100.0	100.0
Feeding Groups:			
Collector Gatherer (%)	57.0	65.5	61.2
Collector Filterer (%)	3.3	1.3	2.3
Predator (%)	27.2	21.7	24.4
Shredder - Detritus (%)	11.6	10.2	10.9
Shredder - Herbivore (%)	0.3	0.7	0.5
Scraper (%)	0.7	0.7	0.7
Total (%)	100.0	100.0	100.0

Stowe Resort-West Branch 8.0
Kick Net Results - Both Replicates
September 22, 2014

APPLICATION OF PROPOSED STATE OF VERMONT BIOCRITERIA (2/12/02)

Metric	Value	ANR Scoring Guidelines for SHG		
		B2-3	B1	A1
Density	469.7	Pass	Pass	Indet.-
Richness	30.0	Pass	Indet.-	Fail
EPT	19.0	Pass	Indet.	Fail
PMA-O	60.3	Pass	Pass	Indet.-
BI	3.71	Pass	Fail	Fail
%Oligo	11.2	Indet.	Fail	Fail
EPT/EPT+C	0.95	Pass	Pass	Pass
PPCS-FG	0.45	Indet.+	Indet.	Indet.-
Outcome:	Meet Class B2-3			

Stowe Resort-West Branch 7.5
Kick Net Results - Both Replicates
September 22, 2014

	Rep. #1	Rep. #2	Average
Community Metrics:			
Density/Unit	334.9	353.5	344.2
Species Richness	29	30	29.5
EPT Richness	19	18	18.5
Bio Index (old)	1.26	1.16	1.21
Bio Index (new)	2.29	2.10	2.19
% dominant taxa	30.3	35.5	32.9
EPT/EPT+C	0.91	0.91	0.91
EPT/Richness	0.66	0.60	0.63
% Model Affinity (orders)	68.9	67.1	68.0
PPCS - functional groups	0.40	0.32	0.36
Major Groups:			
Coleoptera	0.0	0.0	0.0
Diptera (%)	15.3	15.7	15.5
Ephemeroptera (%)	24.4	21.3	22.9
Trichoptera (%)	9.1	8.0	8.6
Plecoptera (%)	43.0	45.7	44.3
Oligochaeta (%)	8.1	8.6	8.4
Bivalvia (%)	0.0	0.3	0.2
Megaloptera (%)	0.0	0.0	0.0
Odonata (%)	0.0	0.0	0.0
Other (%)	0.0	0.0	0.0
Total (%)	100.0	99.7	99.8
Feeding Groups:			
Collector Gatherer (%)	38.8	37.3	38.1
Collector Filterer (%)	0.7	0.6	0.6
Predator (%)	48.2	52.2	50.2
Shredder - Detritus (%)	11.4	9.3	10.3
Shredder - Herbivore (%)	0.3	0.0	0.2
Scraper (%)	0.7	0.6	0.6
Total (%)	100.0	100.0	100.0

Stowe Resort-West Branch 7.5
Kick Net Results - Both Replicates
September 22, 2014

APPLICATION OF PROPOSED STATE OF VERMONT BIOCRITERIA (2/12/02)

Metric	Value	ANR Scoring Guidelines for SHG		
		B2-3	B1	A1
Density	344.2	Pass	Fail	Fail
Richness	29.5	Pass	Fail	Fail
EPT	18.5	Pass	Indet.-	Fail
PMA-O	68.0	Pass	Pass	Indet.-
BI	2.19	Pass	Pass	Pass
%Oligo	8.4	Pass	Fail	Fail
EPT/EPT+C	0.91	Pass	Pass	Pass
PPCS-FG	0.36	Indet.-	Fail	Fail
Outcome:	Meets Class B2-3			

Stowe Resort-West Branch 6.5
Kick Net Results - Both Replicates
September 22, 2014

	Rep. #1	Rep. #2	Average
Community Metrics:			
Density/Unit	348.6	360.0	354.3
Species Richness	31	35	33.0
EPT Richness	21	22	21.5
Bio Index (old)	1.65	1.51	1.58
Bio Index (new)	3.33	3.01	3.17
% dominant taxa	34.8	28.6	31.7
EPT/EPT+C	0.96	0.90	0.93
EPT/Richness	0.68	0.63	0.65
% Model Affinity (orders)	60.9	69.3	65.1
PPCS - functional groups	0.50	0.49	0.49
Major Groups:			
Coleoptera	0.0	0.0	0.0
Diptera (%)	4.9	13.3	9.1
Ephemeroptera (%)	58.4	50.5	54.4
Trichoptera (%)	14.1	11.1	12.6
Plecoptera (%)	18.4	24.1	21.2
Oligochaeta (%)	4.3	0.6	2.4
Bivalvia (%)	0.0	0.0	0.0
Megaloptera (%)	0.0	0.0	0.0
Odonata (%)	0.0	0.3	0.2
Other (%)	0.0	0.0	0.0
Total (%)	100.0	100.0	100.0
Feeding Groups:			
Collector Gatherer (%)	57.7	51.1	54.4
Collector Filterer (%)	5.6	6.0	5.8
Predator (%)	20.3	26.3	23.3
Shredder - Detritus (%)	8.5	7.0	7.8
Shredder - Herbivore (%)	0.0	0.0	0.0
Scraper (%)	7.9	9.5	8.7
Total (%)	100.0	100.0	100.0

Stowe Resort-West Branch 6.5
Kick Net Results - Both Replicates
September 22, 2014

APPLICATION OF PROPOSED STATE OF VERMONT BIOCRITERIA (2/12/02)

Metric	Value	ANR Scoring Guidelines for SHG		
		B2-3	B1	A1
Density	354.3	Pass	Indet.-	Fail
Richness	33.0	Pass	Pass	Fail
EPT	21.5	Pass	Pass	Indet
PMA-O	65.1	Pass	Pass	Indet.
BI	3.17	Pass	Pass	Indet.-
%Oligo	2.4	Pass	Pass	Indet.-
EPT/EPT+C	0.93	Pass	Pass	Pass
PPCS-FG	0.49	Pass	Indet.+	Indet.-
Outcome:	Meets Class B2-3			

Stowe Resort-Big Spruce RM 0.3
Kick Net Results
September 22, 2014 Replicate 1

Community Metrics:	
Density/Unit	132.0
Species Richness	25
EPT Richness	11
Bio Index (old)	1.18
Bio Index (new)	1.71
% dominant taxa	24.2
EPT/EPT+C	0.66
EPT/Richness	0.44
% Model Affinity (orders)	48
PPCS - functional groups	0.38

Major Groups:	
Coleoptera	0.0
Diptera (%)	41.7
Ephemeroptera (%)	0.8
Trichoptera (%)	6.1
Plecoptera (%)	45.5
Oligochaeta (%)	5.3
Bivalvia (%)	0.0
Megaloptera (%)	0.8
Odonata (%)	0.0
Other (%)	0.0
Total (%)	100.0
Feeding Groups:	
Collector Gatherer (%)	32.6
Collector Filterer (%)	0.8
Predator (%)	44.7
Shredder - Detritus (%)	20.5
Shredder - Herbivore (%)	0.0
Scraper (%)	1.5
Total (%)	100.0

Stowe Resort-Big Spruce RM 0.3
Kick Net Results
September 22, 2014 Replicate 1

APPLICATION OF PROPOSED STATE OF VERMONT BIOCRITERIA (2/12/02)

Metric	Value	ANR Scoring Guidelines for SHG		
		B2-3	B1	A1
Density	132	Fail	Fail	Fail
Richness	25	Indet.+	Fail	Fail
EPT	11	Fail	Fail	Fail
PMA-O	48	Indet.+	Fail	Fail
BI	1.71	Pass	Pass	Pass
%Oligo	5.3	Pass	Indet.+	Fail
EPT/EPT+C	0.66	Pass	Pass	Indet.+
PPCS-FG	0.38	Indet.-	Fail	Fail
Outcome:	Does not meet Class B2-3			

Stowe Resort-Big Spruce RM 0.2
Kick Net Results - Both Replicates
September 22, 2014

	Rep. #1	Rep. #2	Average
Community Metrics:			
Density/Unit	130.0	177.0	153.5
Species Richness	28	29	28.5
EPT Richness	14	15	14.5
Bio Index (old)	1.09	1.24	1.16
Bio Index (new)	1.90	2.06	1.98
% dominant taxa	33.8	33.9	33.9
EPT/EPT+C	0.80	0.71	0.76
EPT/Richness	0.50	0.52	0.51
% Model Affinity (orders)	62.5	60.8	61.7
PPCS - functional groups	0.42	0.42	0.42
Major Groups:			
Coleoptera	1.5	0.6	1.1
Diptera (%)	23.8	37.9	30.8
Ephemeroptera (%)	7.7	7.3	7.5
Trichoptera (%)	12.3	12.4	12.4
Plecoptera (%)	49.2	39.0	44.1
Oligochaeta (%)	3.1	2.8	3.0
Bivalvia (%)	0.0	0.0	0.0
Megaloptera (%)	2.3	0.0	1.2
Odonata (%)	0.0	0.0	0.0
Other (%)	0.0	0.0	0.0
Total (%)	100.0	100.0	100.0
Feeding Groups:			
Collector Gatherer (%)	26.2	30.5	28.3
Collector Filterer (%)	8.5	6.2	7.3
Predator (%)	53.1	51.4	52.2
Shredder - Detritus (%)	9.2	10.2	9.7
Shredder - Herbivore (%)	0.0	0.0	0.0
Scraper (%)	3.1	1.7	2.4
Total (%)	100.0	100.0	100.0

Stowe Resort-Big Spruce RM 0.2
Kick Net Results - Both Replicates
September 22, 2014

APPLICATION OF PROPOSED STATE OF VERMONT BIOCRITERIA (2/12/02)

Metric	Value	ANR Scoring Guidelines for SHG		
		B2-3	B1	A1
Density	153.5	Fail	Fail	Fail
Richness	28.5	Pass	Fail	Fail
EPT	14.5	Fail	Fail	Fail
PMA-O	61.7	Pass	Pass	Indet.-
BI	1.98	Pass	Pass	Pass
%Oligo	3.0	Pass	Pass	Indet.-
EPT/EPT+C	0.76	Pass	Pass	Pass
PPCS-FG	0.42	Indet.+	Indet.-	Fail
Outcome:	Does not meet Class B2-3			

Stowe Resort-Pinnacle Brook RM 0.1
Kick Net Results - Both Replicates
September 22, 2014

	Rep. #1	Rep. #2	Average
Community Metrics:			
Density/Unit	367.6	485.1	426.3
Species Richness	36	35	35.5
EPT Richness	21	21	21.0
Bio Index (old)	1.25	1.29	1.27
Bio Index (new)	2.13	2.17	2.15
% dominant taxa	27.6	28.1	27.9
EPT/EPT+C	0.72	0.68	0.70
EPT/Richness	0.58	0.60	0.59
% Model Affinity (orders)	65.1	64.7	64.9
PPCS - functional groups	0.45	0.51	0.48
Major Groups:			
Coleoptera	0.3	1.0	0.7
Diptera (%)	30.9	32.3	31.6
Ephemeroptera (%)	13.6	9.9	11.8
Trichoptera (%)	10.4	13.3	11.8
Plecoptera (%)	43.6	42.4	43.0
Oligochaeta (%)	0.9	1.0	1.0
Bivalvia (%)	0.0	0.0	0.0
Megaloptera (%)	0.0	0.0	0.0
Odonata (%)	0.3	0.0	0.1
Other (%)	0.0	0.0	0.0
Total (%)	100.0	100.0	100.0
Feeding Groups:			
Collector Gatherer (%)	39.8	40.4	40.1
Collector Filterer (%)	4.7	6.8	5.8
Predator (%)	37.4	36.2	36.8
Shredder - Detritus (%)	15.7	15.1	15.4
Shredder - Herbivore (%)	0.0	0.3	0.1
Scraper (%)	2.4	1.3	1.8
Total (%)	100.0	100.0	100.0

Stowe Resort-Pinnacle Brook RM 0.1
Kick Net Results - Both Replicates
September 22, 2014

APPLICATION OF PROPOSED STATE OF VERMONT BIOCRITERIA (2/12/02)

Metric	Value	ANR Scoring Guidelines for SHG		
		B2-3	B1	A1
Density	426.3	Pass	Indet.+	Fail
Richness	35.5	Pass	Pass	Indet.+
EPT	21.0	Pass	Pass	Indet.
PMA-O	64.9	Pass	Pass	Indet.
BI	2.15	Pass	Pass	Pass
%Oligo	1.0	Pass	Pass	Indet.+
EPT/EPT+C	0.70	Pass	Pass	Pass
PPCS-FG	0.48	Pass	Indet.+	Indet.-
Outcome:	Meets Class B1			

Young of the Year (YOY) - Wild Brook Trout per Mile

Data Provided by Rich Kirn of the Vermont Department of Fish and Wildlife

YOY					
	Ranch 10	Ranch 20	West Branch 10	West Branch 20	West Branch 23
1994	NS	NS	880	430	NS
1995	NS	NS	1862	1145	NS
1996	NS	NS	327	143	NS
1997	409	279	287	89	127
1998	560	665	341	555	1014
1999	2155	2146	2590	2380	1732
2000	172	322	422	161	148
2001	1487	1138	1787	1557	908
2002	819	665	1164	1915	1014
2003	1078	1331	2329	2273	1964
2004	603	494	1245	412	275
2005	1595	1245	1867	1897	1309
2006	388	300	522	626	275
2007	1422	1223	1787	1324	803
2008	1401	2018	4818	1163	612
2009	560	1138	1184	1307	486
2010	1293	708	1445	931	718
2011	172	86	1225	841	169
2012	2909	3434	2449	3043	2196
2013	647	279	2269	1181	739
2014	259	429	1004	465	486
Mean 1997-2014	**996.1**	**994.4**	**1596.4**	**1228.9**	**831.9**
Max	**2909**	**3434**	**4818**	**3043**	**2196**
Min	**172**	**86**	**287**	**89**	**127**

Yearling and Older - Wild Brook Trout per Mile

Data Provided by Rich Kirn of the Vermont Department of Fish and Wildlife

1++					
	Ranch 10	Ranch 20	West Branch 10	West Branch 20	West Branch 23
1994	NS	NS	607	376	NS
1995	NS	NS	757	322	NS
1996	NS	NS	553	645	NS
1997	798	258	388	412	844
1998	754	408	261	214	401
1999	689	751	622	573	1774
2000	1164	944	1225	1343	1900
2001	991	408	703	501	739
2002	906	601	1044	663	802
2003	905	815	943	269	274
2004	1056	623	1245	1163	908
2005	1186	407	944	931	887
2006	1034	816	763	913	1014
2007	776	580	301	788	866
2008	1681	858	522	788	1352
2009	1573	987	984	1522	1056
2010	1875	1481	743	1413	1499
2011	518	494	863	251	295
2012	690	343	683	680	380
2013	1702	1094	642	1504	1035
2014	1272	794	462	1164	845
Mean 1997-2014	**1087.2**	**703.4**	**741.0**	**838.4**	**937.3**
Max	**1875**	**1481**	**1245**	**1522**	**1900**
Min	**518**	**258**	**261**	**214**	**274**