A Comparative Assessment of the Water Quality and Macroinvertebrate Assemblage Characteristics of the Batten Kill with Several Other Wild Trout Streams in Vermont

by
Vermont Department of Environmental Conservation
Water Quality Division
Biomonitoring and Aquatic Studies Section
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Introduction: The Batten Kill located in Bennington County of southwestern Vermont has long been recognized as one of this state's top trout fishing streams and has been grouped with other important trout fisheries of the United States. Prior to the introduction of brown trout to the river around 1900, the only salmonid inhabiting the river was the native brook trout. Following the initial releases of brown trout, the species established itself as a self-sustaining wild population around which the sport fishery developed further and built upon the river's reputation as Vermont's pre-eminent trout stream. All stocking was phased out by 1976 and since then the river's fishery has been entirely dependent on wild fish production. In 1991 the river was designated by the Vermont Water Resources Board as the state's first Outstanding Resource Water. Both creel and electroshocking surveys by the Vermont Department of Fish and Wildlife (F&W) have shown a decline in the wild trout populations in the Batten Kill during the 1990's.

Goals and Objectives: The goal of this project was to collect and analyze representative macroinvertebrate assemblage and water chemistry samples from the Batten Kill and four other high quality self-sustaining trout (brown trout to the extent feasible) fisheries. Data would be evaluated for the purposes of making inter-stream comparison, and comparison to a larger State-wide reference quality database of similar type streams (VTDEC). The results would be used to provide information relative to the potential role of secondary productivity and overall biological integrity on the salmonid fishery. Comparing the Batten Kill with four other high quality trout fisheries would demonstrate whether or not there was a difference in secondary productivity and biological integrity variables between the trout streams (and among other similar high quality streams) that would account for the fisheries declines that are unique, among the study sites, to the Batten Kill. All five study streams are excellent trout (brown and/or rainbow) fisheries maintained through natural reproduction.

Materials and Methods: Samples were collected from sites that were previously established with long-term salmonid population data and which have been previously sampled in 2001 for productivity-related water chemistry parameters. A total of 16 sites were sampled: five sites on the Batten Kill; two on the Castleton River; two on the Poultney River; two on the Mettawee River; and five on the Dog River. **Table 1** lists the locations of the sampling sites and a brief description of the location. See **Appendix D** for photographs of all sampling locations.

All macroinvertebrate samples were collected and processed using a standard Kick net (KN) collection method, and sub-sampling procedures employed by the VTDEC, with the exception of the lower Castleton River site, where, due to its low gradient, samples were collected using a Sweep net method. All samples were collected over a 3-day period during the late summer early fall index period from September 24-26, 2002. All samples were processed at the VTDEC RA LaRosa Environmental Laboratory by VTDEC staff. All organisms were identified to the lowest possible level, generally genus or species.

Table 1 - Locations of Chemistry and Macroinvertebrate Assemblage sampling sites.

Location	Station #	River Mile	Town	Description	Latitude	Longitude	Drainage Area Km^2	Elevation ft
Dog River	**1**	0.9	Montpelier	Located above power station bridge about 500m, below bend in river adjacent to RR bed.	441444	723554	242	515
Dog River	**2**	5.7	Berlin	Located below Riverton Rt. 12 bridge about 1mi. Where road, railroad, and ledges all compress river valley.	441244	723745	217	565
Dog River	**3**	7.0	Berlin	Located above the Rte. 12 Bridge in Riverton.	441158	723803	208	573
Dog River	**4**	8.6	Northfield	Located above Bail St., Slaughterhouse covered bridge in Northfield Falls.	441005	723920	160	642
Dog River	**5**	14.8	Northfield	Located above Golf Course about 1/4 mile river on the east side of road.	440638	724132	35	802
Castleton River	**1**	4.8	Castleton	Located about 50 meters below Lake Bomoseen outlet stream.	433602	731425	173	360
Castleton River	**2**	9.6	Castleton	Located below first bridge crossing east of Castleton on Route 4.	433648	730946	89	445
Poultney River	**1**	31.9	Middletown Springs	Located Rte. 114 below Burnham Hollow about 1mile. South side of Road,off new private dirt road.	432942	730934	74	670
Poultney River	**2**	32.9	Middletown Springs	Located Rte. 114 immediately below bridge at Burnham Hollow and apple orchards.	432902	730853	67	735
Mettawee River	**1**	23.6	Pawlet	Located above Rte. 153 bridge and bend in first riffle.	432223	731347	291	515
Mettawee River	**2**	32.5	Rupert	Located off of Rte. 30 1 mile SE of Rupert at F&W access area.	431747	730839	68	755
Batten Kill	**1**	32.9	Arlington	Located immediately below Arlington cemetery off Rte. 313.	430611	731344	431	535
Batten Kill	**2**	36.5	Arlington	Located about 700 m below River Road Bridge below Arlington village.	430446	731022	336	590
Batten Kill	**3**	47.7	Manchester	Located 120m below new Manchester WWTF.	430914	730322	156	648
Batten Kill	**4**	50.1	Manchester	Located under/below Rte. 11 & 30 Bridge crossing, 3/4 mile below Dufrense Pond Dam.	431024	730216	150	690
Batten Kill	**5**	55.5	Dorset	Located above old Rte. 7 bridge East Dorset, below dirt side road bridge.	431337	730042	24	755

All sites were sampled for water chemistry four times between May and November, 2002 (May 22-23, July 23-24, September 18-19, November 20-21). Sampling was accomplished over a two-day period, with the Castleton, Batten Kill, Poultney, and Mettawee sampled on day one, and the Dog River sampled on day two. Samples were collected by Fish and Wildlife personnel, kept on ice in the field, and delivered to the VTDEC lab in Waterbury on the afternoon of the second day of sampling. Field observations, including temperature, relative discharge, and general appearance of water, were recorded on field data sheets. Samples were logged into the VTDEC laboratory data management system, labeled, and prepared for analysis (acidification, filtering, etc). Methods for the collection and preservation of samples followed standard operating procedures as described by VTDEC laboratory protocols. Samples were collected by wading into the river and filling sample bottles from a well mixed portion of the stream. Sample bottles and transport containers were supplied by the VTDEC laboratory. Analyses were conducted at the DEC LaRosa Environmental Laboratory using standard USEPA analytical protocols for the target analytes (*total and dissolved phosphorus; nitrate , ammonia and total nitrogen; total alkalinity; chloride; sulfate;, potassium, sodium, calcium and, magnesium; pH, turbidity and specific conductance).*

Quality Assurance: Water quality sample bottles were prepared at the DEC laboratory using standard preparation procedures. Sampling instructions and field data sheets were provided to samplers. For each sampling event, one field replicate sample was collected and analyzed, and relative percent difference calculated as a measure of overall precision. Analytical precision and accuracy were evaluated by calculating the relative percent difference of analytical duplicates (precision) and percent recovery of spiked samples (relative bias).

Macroinvertebrate quality assurance was accomplished through implementation of standard operating procedures.

Results:

Macroinvertebrates – Macroinvertebrate samples were processed and analyzed according to VTDEC procedures for determining the macroinvertebrate biological condition. A series of community "metrics" are calculated from the raw data. These "metrics" represent various aspects of the benthic community structure and function. These metric values are compared to ranges of values know to occur in minimally disturbed rivers of similar size and nature (reference condition). VTDEC presumes that deviation from the range of reference condition implies adverse impacts. Threshold criteria have been derived by VTDEC that indicate compliance or non-compliance with Vermont Water Quality Standards for aquatic life use. **Table 2** summarizes the relevant metrics and overall site assessment for the 16 sites. A final assessment of less than "good" indicates potential impairment of the aquatic biota. **Table 3** summarizes the percent composition by major taxonomic group (e.g. the Orders of mayflies, stoneflies, etc) and **Table 4** summarizes the percent composition by functional group. The values reported in **Tables 2 - 4** provide the basis for evaluating the structural and biological integrity of the macroinvertebrate community. **Appendix A** presents a complete list of macroinvertebrate taxa, their relative abundance and percent composition for each sampling site.

Table 2 - Macroinvertebrate assemblage metrics and assessment based on VTDEC Reference streams. All samples collected in 2002 as part of Comparison of Wild Salmonid Streams Study.

Location	Drainage Area km2	River Mile	Station	Date	Density	Richness	Ept	PMA-O	BI	Oligochaeta %	Ept/EptChiro	PPCSF	Assessment
Dog River	242	0.9	1	9/24	5508	46.0	22.0	86.6	4.50	0.0	0.88	0.47	Good
Dog River	217	5.7	2	9/24	4328	55.0	24.0	90.4	4.10	0.0	0.80	0.65	Vg-Good
Dog River	208	7.0	3	9/24	5876	55.0	21.0	85.8	4.52	0.2	0.74	0.51	Good
Dog River	160	8.6	4	9/24	4424	54.0	20.0	**47.7**	**5.52**	0.4	**0.32**	0.49	**Fair**
Dog River	35	14.8	5	9/24	2052	41.0	22.0	83.3	2.78	0.0	0.83	0.54	Vgood
Poultney River	74	31.9	1	9/25	3076	54.0	25.0	87.2	3.76	0.0	0.85	0.64	Vgood
Poultney River	67	32.9	2	9/25	2972	59.0	30.0	85.7	3.41	0.0	0.85	0.56	Exc
*Castleton River**	*173*	4.8	*1*	*9/25*	*2288*	*43.0*	*21.0* [1]	*NA*	*7.03*	*0.3*	*0.34*	*NA*	
Castleton River	89	9.6	2	9/25	3416	56.0	25.0	61.6	3.96	0.2	**0.41**	0.44	**Fair-Good**
Mettawee River	291	23.6	1	9/25	2640	44.0	21.0	74.8	3.94	0.3	0.83	0.52	Vg-Good
Mettawee River	68	32.5	2	9/25	1988	55.0	26.0	82.7	3.15	0.6	0.70	0.57	Exc
Batten Kill	431	32.9	1	9/20	2692	47.0	23.0	87.1	3.63	1.2	0.79	0.59	Vgood
Batten Kill	336	36.5	2	9/26	3204	50.0	22.0	85.0	3.86	0.5	0.89	0.51	Vgood
Batten Kill	156	47.7	3	9/26	5232	62.0	26.0	82.8	4.31	0.3	0.85	0.48	Vgood
Batten Kill	150	50.1	4	9/26	3472	47.0	25.0	84.4	3.42	0.7	0.94	0.41	Good
Batten Kill	24	55.5	5	9/26	2896	61.0	26.0	83.8	3.48	0.8	0.72	0.68	Exc
MHG Reference [2]			Exc		>500	>43	>24	>65	>3.50	<2	>65	>.50	
			V.Good		>400	>39	>22	>55	>4.00	<5	>55	.>45	
			Good		>300	>30	>18	>45	>5.00	<12	>45	.>40	

*- This river reach is low gradient and cannot be compared to the MHG Biocriteria.
1- For this one reach EPT number is actually based on COTE richness or taxa from Coleoptera, Odonata, Trichoptera and Ephemeroptera.
2- Threshold values based on state-wide VTDEC reference data base for Medium High Gradient (MHG) stream type.

Table 3 - Macroinvertebrate Assemblage order level percent Composition.

Location	Station	Date	Coleoptera	Diptera	Ephemeroptera	Plecoptera	Trichoptera	Oligochaeta	Other Orders
Dog River	1	9/24	18.2	11.5	33.7	1.9	34.6	0.0	0.1
Dog River	2	9/24	7.4	21.8	37.2	4.6	27.3	0.0	1.7
Dog River	3	9/24	5.8	26.1	25.3	3.1	37.6	0.2	1.9
Dog River	4	9/24	2.1	66.9	2.8	0.5	23.5	0.4	3.9
Dog River	5	9/24	0.6	19.5	23.2	10.1	45.6	0.0	1.0
Poultney River	1	9/25	3.4	17.0	29.8	3.5	43.7	0.0	2.6
Poultney River	2	9/25	5.9	18.0	26.9	1.3	46.6	0.0	1.2
Castleton River	2	9/25	8.4	54.5	14.8	5.4	16.6	0.2	0.0
Mettawee River	1	9/25	18.6	15.2	19.2	0.6	45.9	0.3	0.2
Mettawee River	2	9/25	12.3	28.6	29.6	7.2	20.9	0.6	0.8
Batten Kill	1	9/20	6.4	20.7	27.9	1.2	42.2	1.2	0.4
Batten Kill	2	9/26	12.0	10.7	37.5	0.3	38.1	0.5	1.0
Batten Kill	3	9/26	12.7	17.6	24.5	0.9	43.2	0.3	0.8
Batten Kill	4	9/26	9.1	9.4	45.2	0.9	34.0	0.7	0.7
Batten Kill	5	9/26	8.1	31.5	27.5	5.0	26.4	0.8	0.7

Table 4 - Macroinvertebrate assemblage composition by functional feeding groups.

Location	Station	Date	Coll. Gatherer	Coll. Filterer	Predator	Shred Detritus	Shred Herbivore	Scraper
Dog River	1	9/24	16.0	36.7	5.2	0.0	0.6	28.3
Dog River	2	9/24	24.1	25.6	10.5	0.0	1.5	23.6
Dog River	3	9/24	18.4	33.4	10.0	0.0	7.0	19.3
Dog River	4	9/24	32.4	26.8	8.6	0.3	27.0	3.7
Dog River	5	9/24	36.1	43.3	15.0	0.2	1.4	1.2
Poultney River	1	9/25	30.4	27.3	11.6	1.0	7.9	19.9
Poultney River	2	9/25	22.1	24.6	6.5	1.8	10.9	22.7
Castleton River	2	9/25	56.2	10.9	10.1	0.4	9.0	8.4
Mettawee River	1	9/25	14.1	22.4	4.2	1.1	1.1	43.6
Mettawee River	2	9/25	25.4	12.7	13.5	6.0	13.3	24.5
Batten Kill	1	9/20	35.4	40.9	3.0	1.9	2.8	14.9
Batten Kill	2	9/26	14.9	33.0	6.7	1.1	2.0	29.3
Batten Kill	3	9/26	29.0	39.2	4.1	0.2	7.1	19.3
Batten Kill	4	9/26	21.5	43.2	5.6	0.1	0.1	25.2
Batten Kill	5	9/26	28.7	28.5	10.1	1.0	6.8	13.3

Chemistry – Median values for chemical and physical variables are presented in **Table 5**. Results from both 2001 and 2002 are presented, as the sampling frequency and sampling strategy were the same for both years. In both years, the number of samples (N) is four. Field notes and observations indicate that with one exception, samples were collected during relatively low flow when the water was clear and free of obvious turbidity.

Average flows were calculated for each site for the day of sampling using average daily flow data from USGS gauges on the Poultney, Mettawee, Dog, and Batten Kill, and then using drainage area at each site to extrapolate a flow for each sampling site, and date. Median values for each site for both 2001 and 2002 are presented below **Figure 1**. The data confirm observations that 2001 was a very dry year as reflected by very low flows (some samples were collected at flows below 7Q10 flow). Although still dry, 2002 was a wetter year as is reflected by flows. Ambient water chemistry is more strongly affected by point sources during low flow periods, as will be discussed later. Full discharge plots for the four USGS gauges are presented in **Appendix D**.

Figure 1: Median average daily flows for the days sampled at sampling sites for 2000 and 2002. Data do not reflect the fact that during the July 23, 2002 sampling, flows in the Batten Kill increased dramatically during sampling.

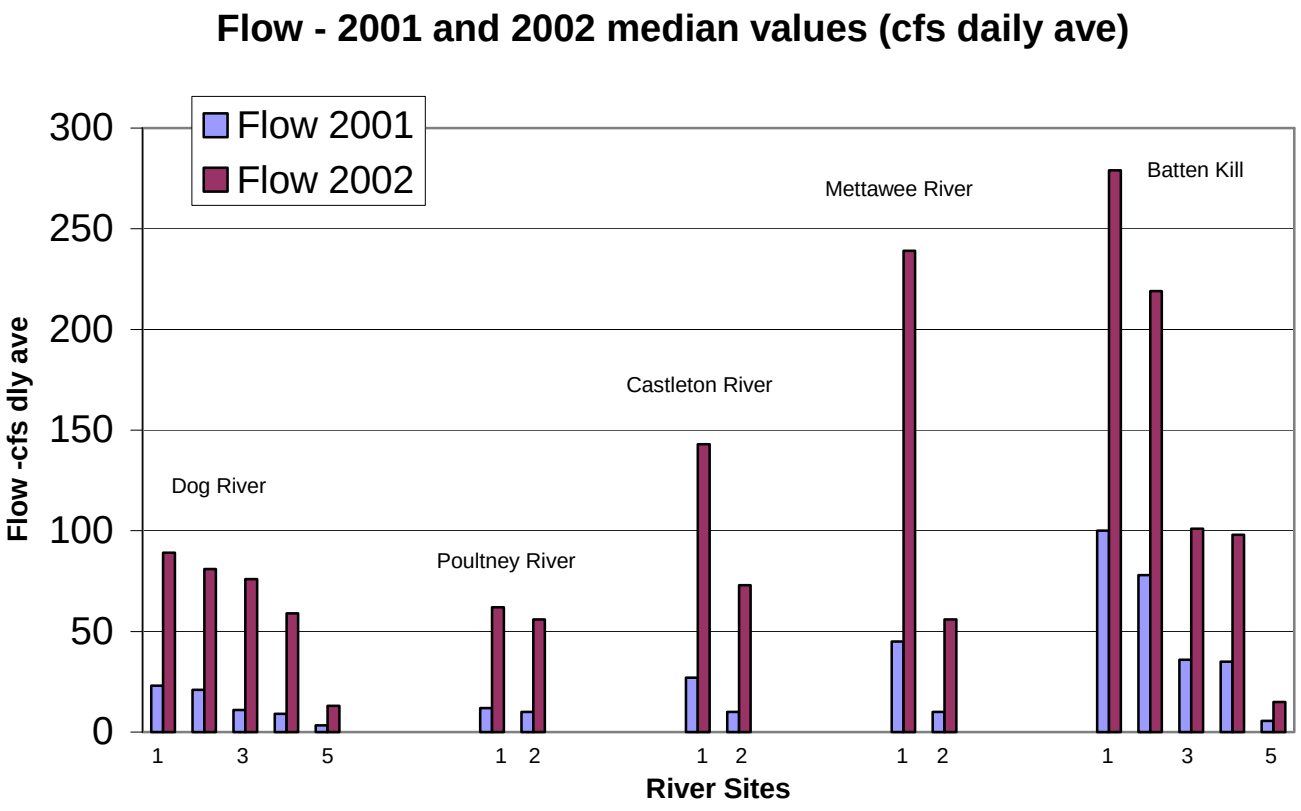


Table 5 – Median chemical-physical results by site for 2002 and 2001. N = 4 for each year respectively.

Location	Station	Date	Ca	Mg	K	Na	Cl	NO3	NH3	TOT-N	TP	TDP	SO4	Alk	Cond	Turb	pH	Flow
			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	mg/l	mg/l	umho/cm	ntu	su	cfs
Dog River 1	0.9	2002	17.5	2.37	0.563	11.59	18.1	0.30	<0.05	0.39	11	7	9.15	42.2	168	0.85	7.68	89
Dog River 2	5.7	2002	17.3	2.37	0.613	11.55	18.3	0.27	<0.05	0.57	24	19	8.96	44.9	171	1.03	7.63	81
Dog River 3	7.0	2002	14.2	1.92	0.567	9.07	13.9	0.28	<0.05	0.41	16	12	8.23	34.5	128	1.20	7.74	76
Dog River 4	8.6	2002	18.6	2.33	0.619	11.34	17.6	0.30	0.1	0.45	32	26	8.70	48.4	172	0.95	7.71	59
Dog River 5	14.8	2002	10.8	1.90	0.488	7.58	11.4	0.21	<0.05	0.26	6	4	6.27	27.5	79	0.62	7.73	13
Poultney River 1	31.9	2002	32.6	4.85	1.400	7.93	11.9	0.37	<0.05	0.46	11	6	11.80	75.5	218	0.55	8.15	62
Poultney River 2	32.9	2002	28.4	4.70	1.445	7.95	11.7	0.32	<0.05	0.45	13	8	11.70	74.3	214	0.71	8.04	56
Castleton 1	4.8	2002	29.9	6.19	1.066	16.10	25.5	0.40	0.1	0.65	15	8	11.25	86.6	277	0.98	7.62	143
Castleton River 2	9.6	2002	30.6	5.90	0.771	13.50	22.2	0.19	<0.05	0.31	6	5	9.40	72.4	258	0.23	7.26	73
Mettawee River 1	23.6	2002	32.4	5.18	1.495	5.12	8.5	0.77	<0.05	0.86	9	5	10.90	89.8	227	1.05	8.07	239
Mettawee River 2	32.5	2002	36.1	6.15	0.791	4.51	7.4	0.39	<0.05	0.45	6	3	9.44	103.2	241	0.59	7.89	56
Batten Kill 1	32.9	2002	24.1	7.50	0.777	5.21	8.3	0.26	<0.05	0.37	12	7	6.13	81.6	193	1.80	7.95	279
Batten Kill 2	36.5	2002	23.0	7.80	0.841	6.76	10.5	0.25	<0.05	0.39	13	8	5.78	80.9	200	2.00	7.94	219
Batten Kill 3	47.7	2002	36.9	11.65	1.120	9.14	15.2	0.39	<0.05	0.64	84	40	5.90	120.0	288	1.78	8.04	101
Batten Kill 4	50.1	2002	30.3	14.70	1.025	7.98	14.0	0.30	<0.05	0.43	8	4	6.02	126.5	295	1.33	7.85	98
Batten Kill 5	55.5	2002	14.7	6.53	0.712	2.69	3.3	0.12	<0.05	0.21	5	4	4.67	60.8	201	0.60	7.58	15
Location	Station	Date	Ca	Mg	K	Na	Cl	NO3	NH3	Tot N	TP	TDP	SO4	Alk	Cond	Turb	pH	Flow
			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	mg/l	mg/l	umho/cm	ntu	su	cfs
Dog River 1	0.9	2001	18.2	2.87	0.942	11.4	26	0.48	<0.05	0.67	19	9	12.8	45.8	207	NA	7.71	23
Dog River 2	5.7	2001	17.8	2.66	0.942	15.2	22.4	0.65	<0.05	0.86	23	17	10.8	43.7	194	NA	7.72	21
Dog River 3	7.0	2001	18.6	2.76	1.14	15.7	25.5	0.88	<0.05	1.14	66	39	11.9	45.4	212	NA	8.15	11
Dog River 4	8.6	2001	20.3	2.88	1.49	20.6	28.6	1.04	0.52	1.95	198	191	15.5	51.8	242	NA	7.76	9
Dog River 5	14.8	2001	9.07	1.74	0.46	6.94	8.95	0.24	<0.05	0.36	4	4	6.24	24.9	71	NA	7.6	3.3
Poultney River 1	31.9	2001	32.1	5.58	1.46	9.37	13.5	0.42	<0.05	0.52	6	6	10.5	93.7	149	NA	8.56	12
Poultney River 2	32.9	2001	32.1	5.73	1.73	9.11	13.6	0.45	<0.05	0.64	20	11	10.5	94.2	251	NA	8.37	10
Castleton River 1	4.8	2001	35.3	7.3	1.31	19.3	32.5	0.39	<0.05	0.68	13	7	11.9	110	341	NA	7.83	27
Castleton River 2	9.6	2001	32.1	6.93	0.82	14.7	22.8	0.23	<0.05	0.35	7	5	8.39	102	289	NA	7.59	10
Mettawee River 1	23.6	2001	38	6.11	1.46	5.11	8	0.63	<0.05	0.69	8	5	10	109	254	NA	8.42	45
Mettawee River 2	32.5	2001	39.9	6.75	1.73	4.01	6.45	0.43	<0.05	0.52	6	4	9.27	119	265	NA	8.07	10
Batten Kill 1	32.9	2001	26.1	7.8	0.79	5.14	9.05	0.25	<0.05	0.36	10	5	5.25	97	224	NA	8.25	100
Batten Kill 2	36.5	2001	29.2	9.7	0.82	6.39	10.6	0.26	<0.05	0.39	14	5	5.5	107	245	NA	8.3	78
Batten Kill 3	47.7	2001	40.5	13.4	1.31	12.2	20	0.45	<0.05	0.85	152	119	6.6	147	354	NA	8.22	36
Batten Kill 4	50.1	2001	32.8	15.5	1.02	7.8	14.3	0.36	<0.05	0.47	8	8	5.87	139	315	NA	8.11	35
Batten Kill 5	55.5	2001	14.1	7.09	0.72	2.31	3.17	0.12	<0.05	0.23	5	4	4.5	66.3	147	NA	7.83	5.5

Discussion:

The most obvious pattern in the data is the effects of the Northfield and Manchester wastewater treatment facilities (WWTFs) on the Dog River and the Batten Kill respectively. The sampling sites bracket both WWTF's and the effects can be seen in both the chemical and biological data by comparing upstream and downstream results. Biological and chemical indicators suggest that nutrient enrichment is the primary effect on the two rivers. In the Dog River, the effect creates an adverse effect on the biological integrity of the macroinvertebrate community at the first site downstream of the WWTF where field observations verify that dense algal growth and sewage fungus was present at the time of sampling. Increases in the abundance of organisms (increased productivity), the biotic index (an indicator of nutrient enrichment), EPT/EPT&c the relative abundance of chironomids to water quality sensitive EPT species (Ephemeroptera, Plecoptera, Trichoptera) and percent shredder/herbivores indicate an abundance of filamentous algae.

The following figures show the effects on the macroinvertebrate biota. In the figures, the site locations are indicated on the horizontal axis. The sites are grouped by stream and ordered moving upstream from left to right – the most upstream site on a river being the site farthest to the right. The WWTF discharges are located between sites 5 and 4 on the Dog River and between sites 4 and 3 on the Batten Kill.

Figure 2: Macroinvertebrate Biotic Index (1-10)

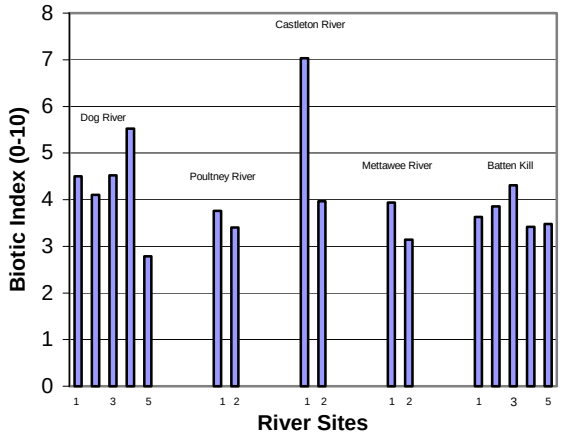


Figure 2 shows the value for the modified Macroinvertebrate Biotic Index (BI) in a bar graph for each station. The index responds to nutrient enrichment and ranges from 0-10, with higher numbers indicating increased enrichment. A value over 5.00 denotes a greater then moderate change in the composition of the aquatic biota (indicating non-support of Aquatic Life biocriteria for Class B streams in Vermont). Note the increase in BI between sites 5 and 4 on the Dog River and sites 4 and 3 on the Batten Kill. The effect appears to be more significant (BI > 5.00, and an increase of 2.74) and sustained for a greater extent downstream in the Dog River than in the Batten Kill. The greater attenuation of the WWTF effect on the BI at the lower Batten Kill stations when compared to the Dog River probably due to the dramatic increase in downstream discharge in the Batten Kill and the resultant dilution of the WWTF effect. The high BI value at the Castleton River site 1 is somewhat of an anomaly, reflecting the fact that the Castleton at this point is a different stream/habitat type than the other river segments sampled (low gradient sand/silt bottom vs. moderate to high gradient with cobble/gravel substrate), with a different expectation for the metric and therefore not directly comparable to the other sites

Figure 3: Macroinvertebrate Density - organisms per unit sampling effort

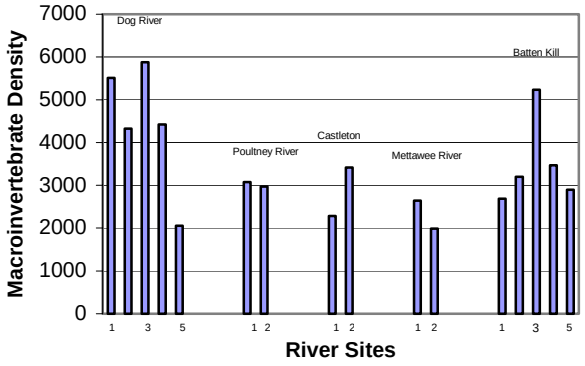


Figure 3 shows that there is a similar effect on benthic organism density. The density of benthic organisms increases as the their environment becomes more enriched up to the point where secondary effects caused by excessive enrichment, such as oxygen depletion, reduce diversity and density. Again, the effect is more significant and sustained in the Dog River than in the Batten Kill. Although the BI is high at Castleton 1, the density is among

the lowest of the sites. This is most likely related to the unique habitat of that site, with sand/silt habitats generally supporting lower densities of organisms than the cobble/gravel habitats found at the other sites.

Figure 4 presents the distribution of the EPT/EPT+Chironomid metric. This metric looks at the relative abundance of the predominantly intolerant mayflies, stoneflies, and caddisflies to the predominantly tolerant Chironomid dipterans or midges. A decrease in this metric may indicate enrichment as many midges utilize attached filamentous algal biomass as a food source. The effect is noticed most significantly below the Northfield WWTF on the Dog River while there is hardly any noticeable effect on this metric due to the Manchester WWTF on the Batten Kill. Low values on the Castleton River site 2 may very well be indicative of some greater than moderate enrichment. Field observations at this site noted significant filamentous algal growth at that site.

Figure 4: EPT/EPT+Chrinomidae Abundance

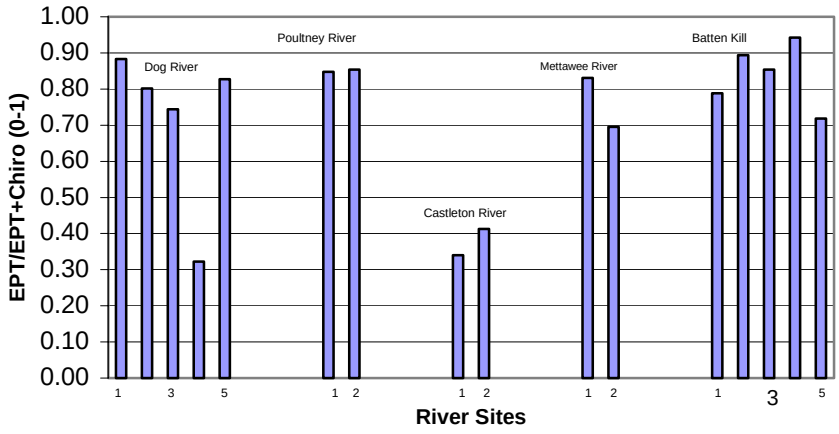


Figure 5 shows a dramatic decrease in mayflies (one of the EPT) with increased dipteran density below Northfield. A similar effect at Castleton 2 indicates some potentially adverse effect to be occurring there. **Figure 6** again emphasizes the degree of effect from the Northfield WWTF as the taxonomic structure has been significantly altered from what would be expected at a site with no adverse impacts. Likewise the Castleton River sites are somewhat altered from expectations. At site 1, this is primarily due to habitat uniqueness.

Figure 5:Mayflies and Dipterans - % Composition

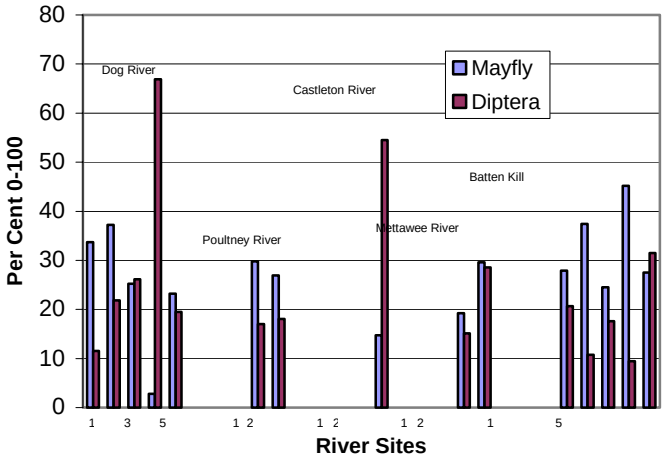
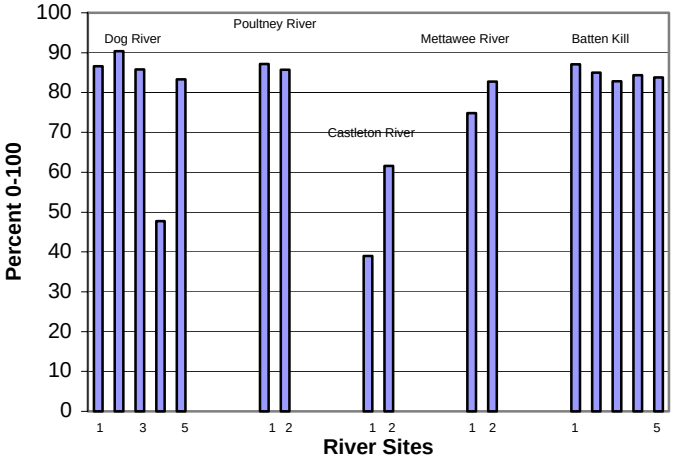
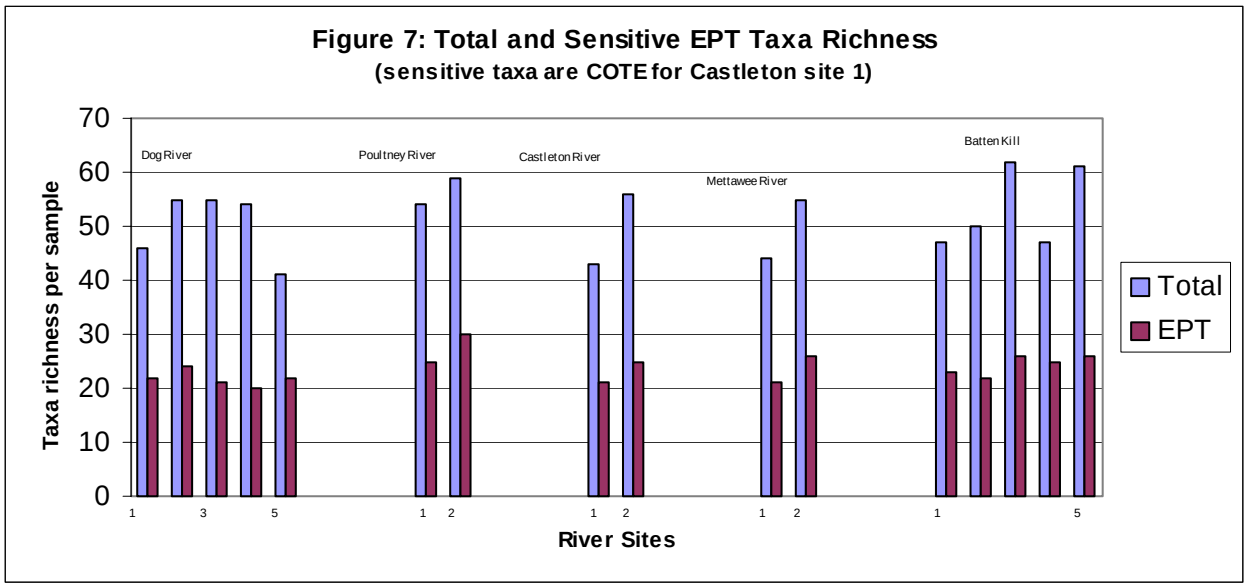


Figure 6: Percent Similarity to Reference Conditions



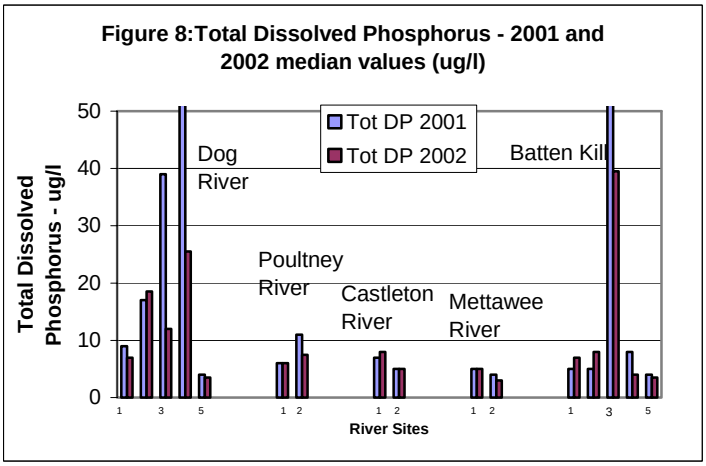
There appeared to be no effect from the wastewater discharges on the taxa richness of the sensitive EPT taxa nor on their overall taxonomic richness of the macroinvertebrate assemblage. **Figure 7** shows relatively even numbers of total taxa and EPT taxa across all sites, although there is some indication that enrichment from the wastewater discharges may enhance the total number of taxa present due to increases in tolerant taxa without loss of sensitive EPT taxa.

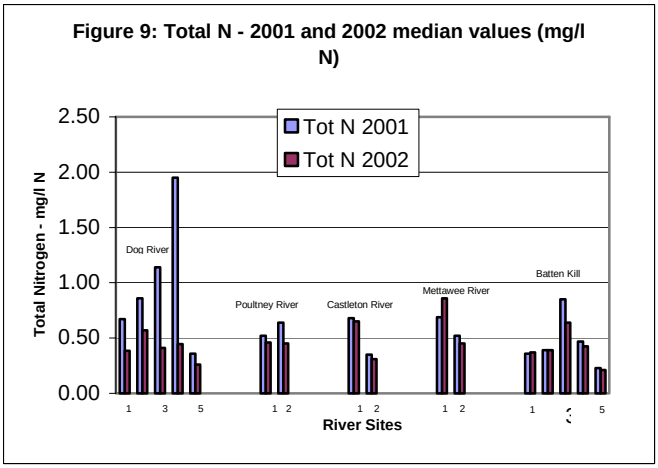


Water samples were collected in both 2001and 2002. The water chemistry tells a story very similar to the biology. The most striking observation is the effect of wastewater disposal on the chemistry of the Dog River and the Batten Kill. The effect is seen primarily in the concentrations of phosphorus and nitrogen. There also appears to be a second pattern related to physiographic region and geology as seen by the distribution of geologically derived constituents such as calcium and alkalinity (CaCO3).

There appear to be some observations that, given the distribution of the data, suggest influences which affect water quality within streams as well as differences in water quality between streams. The validity of the observations noted below has not been tested statistically.

1. Discharges of treated municipal wastes into the Batten Kill and the Dog River strongly effect nitrogen and phosphorus concentrations in the receiving water. The effect appeared to be more persistent in the Dog River than in the Batten Kill, likely due to differences in available dilution in the lower reaches of receiving water. General low flow conditions during the 2001 sampling period may represent "worst case conditions" for these parameters. Maximum total phosphorus concentrations of 208 and 542 ug/l P were observed in the Batten Kill and Dog River respectively. **Figures 8 and 9** show dissolved phosphorus and total nitrogen at all sites for both 2001 and 2002.





2. Concentrations of sodium and chloride appear to be higher in the Dog River and the Castleton River. This may be due to the proximity of roads and general road density.

3. Concentrations of earth metals (calcium and magnesium) and buffering capacity (alkalinity) appear to be lower in the Dog River than in the other study streams. This is likely due to differences in the geologic characteristics of the respective watersheds.

4. Detectable concentrations of ammonia nitrogen (N>0.05 mg/l) were measured only at sites directly influenced by wastewater discharges. The maximum instream concentration detected was 1.69 mg/l N in the Dog River at Station 4, below the Northfield wastewater treatment plant, when flows were extremely low on September 19. This is well below values normally associated with toxicity.

Similarities between sites in chemistry and macroinvertebrate community structure and function were investigated throught the use of cluster analysis. The methodology employed Bray-Curtis distance as a measure of similarity using nearest neighbor application methodology.

The following dendogram (**Figure 10)** depicts the clustering of 2002 median chemistry values at all 16 sites. The most upstream station on the Dog River (Sta.5) is the most different from all the other sites. This site represents "background" condition in the Dog River watershed. The other 4 Dog River sites form another grouping that is highly separated from the other sites. These groupings support observations that the basic chemistry of the Dog River is different from the other streams, most probably related to geological factors. The most upstream Batten Kill site (Sta. 5) also stands alone as a "group", representing a condition less disturbed than the sites further downstream. The remainder of the sites fall into one major grouping, with sub-groupings of: a) the 2 lower Batten Kill sites and the lower Mettawee site; b) the two mid-reach Batten Kill sites (Stas. 3 and 4); c) the upper Mettawee and lower Castleton sites; d) the two Poutney River sites (very similar) and the upper Castleton site.

Figure 10: Median Chemistry 2002

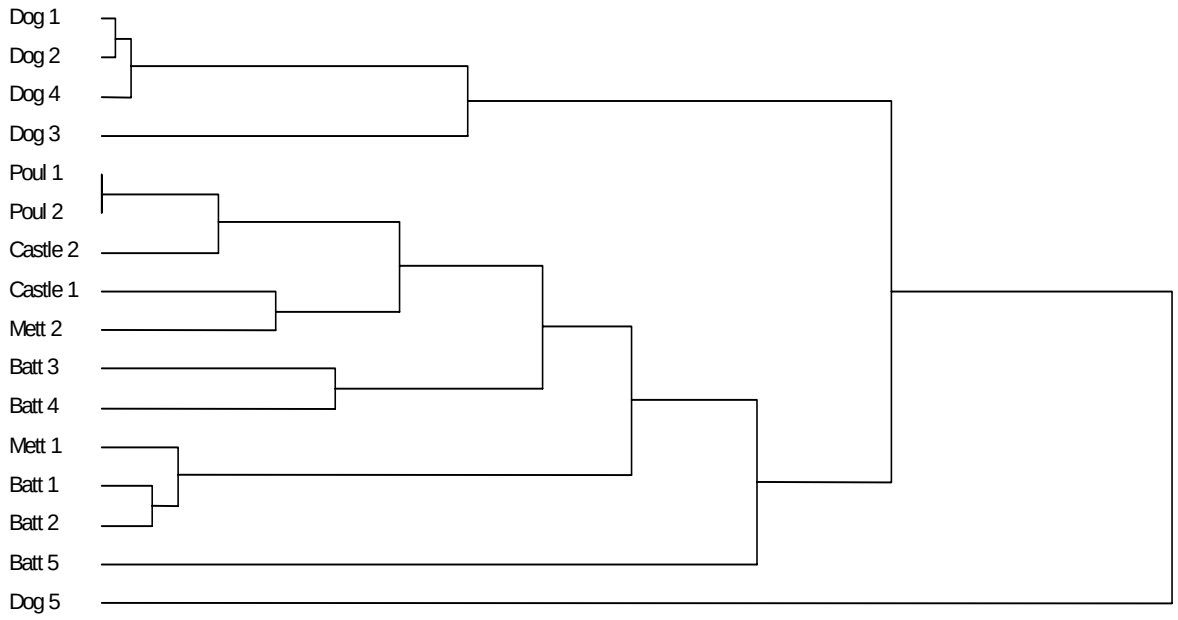


Figure 11 is a dendogram representing the grouping of sites based on the percent composition of the major macroinvertebrate orders identified from each site. The most obvious characteristics of the dendogram are: a) the separation of the lower Castleton River site from all other sites, most probably as a result of its unique habitat characteristics; b) the grouping of the Dog River site 4 site (immediately below the Northfield WWTF) and

Castleton River site 2 as a distinctive pair. These latter two sites are the most impacted and share characteristics typical of nutrient enrichment. The remainder of the sites fall into a major grouping with several subgroups. Within the subgroups, the most similarity is shown among the Batten Kill, Poultney and Mettawee sites. The Dog River sites consistently separate themselves within the subgroups.

Figure 11: Macroinvertebrate Order % Composition

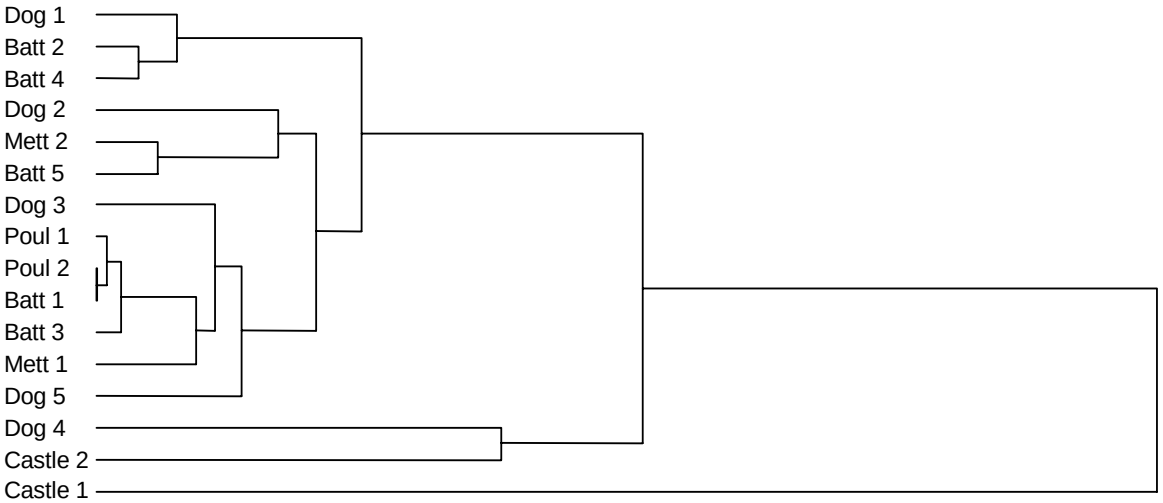
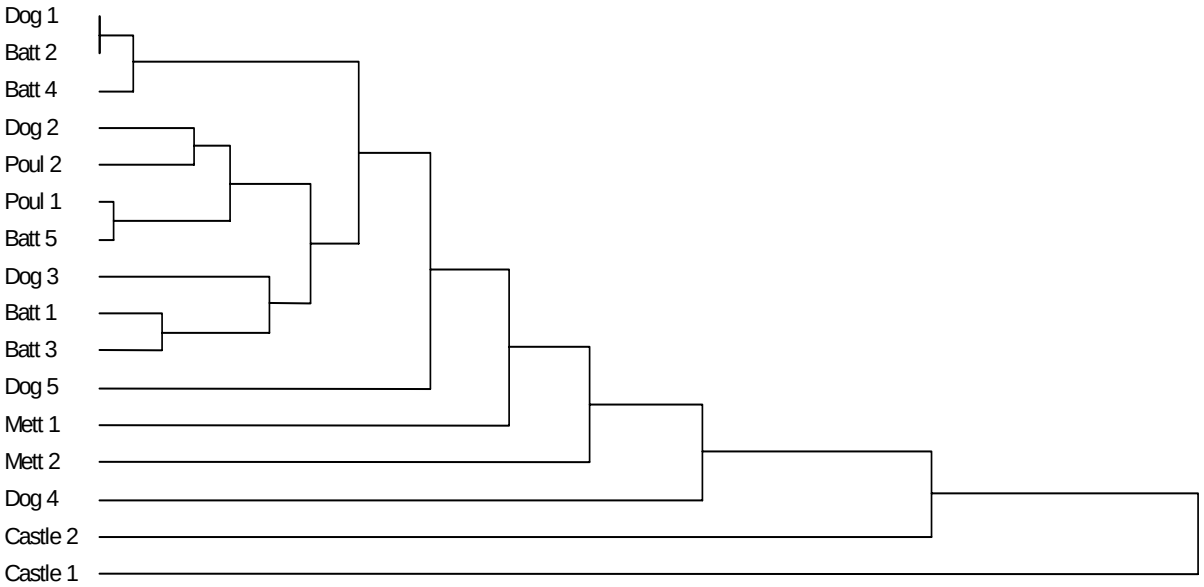


Figure 12 shows the grouping of sites based on the percent composition of macroinvertebrate functional feeding groups. As with the percent order composition, the two Castleton River sites and the Dog River site 4 are identified as unique sites. In addition, the two Mettawee River sites and the Dog River site 5 are identified as unique sites. The remainder of the sites fall into a large subgroup, with each subgroup showing a mix of sites from the Dog and Poultney Rivers and the Batten Kill, demonstrating some differences between sites but not necessarily between rivers.

Figure 12: Macroinvertebrate Functional % Composition



Summary:

Water chemistry and aquatic macroinvertebrate community structure and function were assessed at 16 sites on 5 rivers. The five rivers are managed as naturally-reproducing salmonid fisheries. The intent of the assessments was to evaluate differences in chemical and biological factors between the rivers and the potential for any observed differences to be indicative of possible differences in fishery productivity between the rivers.

Chemistry sampling indicated that the base chemistry of the Dog River was different from the other 4 rivers. This difference was most likely due to differences in geologically-derived constituents. The Batten Kill and Dog River were affected by discharges from the Manchester and Northfield Wastewater Treatment Facilities respectively. The major effect was the elevation of phosphorus and nitrogen concentrations in the receiving waters. The effect was more detrimental to biologic integrity in the Dog River than in the Batten Kill.

Macroinvertebrate communities showed good to excellent biological integrity at 14 of the 16 sites sampled. Two sites, the Dog River site 4 (directly below the Northfield WWTF) and the Castleton River site 2 indicated a greater than moderate enrichment impact on biological integrity. While the impact below the Northfield WWTF was expected due to high nutrient concentration observations, elevated nutrient concentrations were not observed in the Castleton River. A biological effect was observed below the Manchester WWTF in response to elevated nutrients, but the effect was clearly less dramatic and detrimental than in the Dog River. There were biological similarities between the rivers. Differences between sites, often on the same river, were more significant than biological differences between rivers.

There were no obvious chemical or biological factors that were evaluated that would account for differences in salmonid fishery production between the 5 rivers. The elevated phosphorus and nitrogen in the water chemistry of the Batten Kill below the Manchester WWTF and observed responses in the macroinvertebrate community are of a magnitude that would more likely enhance rather than degrade fishery productivity.

Appendix A: Macroinvertebrate Taxa, density (per Kick Net sample), and percent composition collected at each stream site.

Dog River mi 0.9, Station 1

Order	Genera	Species	Density	PercentComp	CommonName
COLEOPTERA	OPTIOSERVUS	sp	836	15.2	
COLEOPTERA	OPTIOSERVUS	trivittatus	64	1.2	
COLEOPTERA	OPTIOSERVUS	ovalis	32	0.6	
COLEOPTERA	STENELMIS	sp	16	0.3	
COLEOPTERA	STENELMIS	crenata	4	0.1	
COLEOPTERA	PSEPHENUS	herricki	48	0.9	
DIPTERA	BEZZIA	sp	20	0.4	
DIPTERA	CRICOTOPUS	spa	4	0.1	
DIPTERA	CRICOTOPUS	bisinctus	8	0.1	
DIPTERA	DEMICRYPTOCHIRONOMUS	sp	4	0.1	
DIPTERA	EUKIEFFERIELLA	pseudomontana	44	0.8	
DIPTERA	MICROTENDIPES	sp	52	0.9	
DIPTERA	NANOCLADIUS	sp	4	0.1	
DIPTERA	POLYPEDILUM	aviceps	12	0.2	
DIPTERA	RHEOTANYTARSUS	distinctissimus	12	0.2	
DIPTERA	SYNORTHOCLADIUS	sp	12	0.2	
DIPTERA	THIENEMANNIELLA	sp	4	0.1	
DIPTERA	THIENEMANNEMYIA	sp	96	1.7	
DIPTERA	TVETENIA	discoloripes	48	0.9	
DIPTERA	TVETENIA	bavarica	212	3.8	
DIPTERA	EMPIDIDAE	unid	8	0.1	Aquatic Dance Fly
DIPTERA	SIMULIUM	tubersom	28	0.5	
DIPTERA	SIMULIUM	vittatum	12	0.2	
DIPTERA	ANTOCHA	sp	8	0.1	
DIPTERA	DICRANOTA	sp	4	0.1	
DIPTERA	HEXATOMA	sp	44	0.8	
EPHEMEROPTERA	BAETIDAE	imm	128	2.3	Small Minnow Mayfly
EPHEMEROPTERA	BAETIS	flavistriga	4	0.1	
EPHEMEROPTERA	BAETIS	intercalaris	160	2.9	
EPHEMEROPTERA	ACENTRELLA	sp	92	1.7	
EPHEMEROPTERA	ACENTRELLA	turbida	12	0.2	
EPHEMEROPTERA	EPHEMERELLIDAE	imm	128	2.3	
EPHEMEROPTERA	EPHEMERELLA	subvaria	316	5.7	
EPHEMEROPTERA	HEPTAGENIIDAE	imm	428	7.8	
EPHEMEROPTERA	STENONEMA	sp	372	6.8	
EPHEMEROPTERA	STENONEMA	luteum	12	0.2	
EPHEMEROPTERA	LEPTOPHLEBIIDAE	unid	44	0.8	
EPHEMEROPTERA	ISONYCHIA	sp	160	2.9	
TRICHOPTERA	GLOSSOSOMA	sp	64	1.2	
TRICHOPTERA	CHEUMATOPSYCHE	sp	496	9.0	
TRICHOPTERA	SYMPHITOPSYCHE	bronta	548	9.9	
TRICHOPTERA	SYMPHITOPSYCHE	morosa	540	9.8	
TRICHOPTERA	SYMPHITOPSYCHE	slossonae	128	2.3	
TRICHOPTERA	SYMPHITOPSYCHE	sparna	68	1.2	
TRICHOPTERA	GOERA	sp	4	0.1	Little Grey Sedge
TRICHOPTERA	CHIMARRA	aterrima	16	0.3	
TRICHOPTERA	DOLOPHILODES	sp	12	0.2	
TRICHOPTERA	RHYACOPHILA	melita	4	0.1	
TRICHOPTERA	RHYACOPHILA	minora	24	0.4	
PLECOPTERA	PARAGNETINA	immarginata	12	0.2	Beautiful Stone
PLECOPTERA	AGNETINA	capitata	4	0.1	Northern Sone
PLECOPTERA	ISOPERLA	sp	68	1.2	
PLECOPTERA	TAENIOPTERYX	sp	20	0.4	
GASTROPODA	PHYSA	sp	4	0.1	Physa
HYDRACHNIDIA	HYGROBATES	sp	4	0.1	

Dog River mi 5.7, Station 2

Order	Genera	Species	Density	PercentComp	CommonName
COLEOPTERA	OPTIOSERVUS	sp	280	6.5	
COLEOPTERA	OPTIOSERVUS	trivittatus	24	0.6	
COLEOPTERA	OPTIOSERVUS	ovalis	12	0.3	
COLEOPTERA	PSEPHENUS	herricki	4	0.1	
DIPTERA	CRICOTOPUS	spa	24	0.6	
DIPTERA	CRICOTOPUS	bisinctus	24	0.6	
DIPTERA	CRICOTOPUS	trifascia	8	0.2	
DIPTERA	CRYPTOCHIRONOMUS	sp	16	0.4	
DIPTERA	EUKIEFFERIELLA	devonica	8	0.2	
DIPTERA	EUKIEFFERIELLA	pseudomontana	16	0.4	
DIPTERA	MICROTENDIPES	sp	44	1.0	
DIPTERA	NILOTANYPUS	sp	4	0.1	
DIPTERA	ORTHOCLADIUS	sp	8	0.2	
DIPTERA	PARAMETRIOCNEMUS	sp	24	0.6	
DIPTERA	POLYPEDILUM	aviceps	256	5.9	
DIPTERA	POTTHASTIA	gaedii	16	0.4	
DIPTERA	RHEOTANYTARSUS	exiguus	16	0.4	
DIPTERA	SUBLETTEA	sp	12	0.3	
DIPTERA	SYNORTHOCLADIUS	sp	60	1.4	
DIPTERA	THIENEMANNIELLA	sp	24	0.6	
DIPTERA	THIENEMANNEMYIA	group	104	2.4	
DIPTERA	TVETENIA	discoloripes	28	0.6	
DIPTERA	TVETENIA	bavarica	44	1.0	
DIPTERA	MICROPSECTRA	sp	4	0.1	
DIPTERA	SIMULIUM	tubersom	24	0.6	
DIPTERA	SIMULIUM	vittatum	12	0.3	
DIPTERA	ANTOCHA	sp	100	2.3	
DIPTERA	HEXATOMA	sp	68	1.6	
EPHEMEROPTERA	BAETIS	sp	8	0.2	
EPHEMEROPTERA	BAETIS	flavistriga	12	0.3	
EPHEMEROPTERA	BAETIS	intercalaris	4	0.1	
EPHEMEROPTERA	ACENTRELLA	sp	64	1.5	
EPHEMEROPTERA	ACENTRELLA	turbida	200	4.6	
EPHEMEROPTERA	BAETISCA	sp	4	0.1	
EPHEMEROPTERA	EPHEMERELLIDAE	imm	456	10.5	
EPHEMEROPTERA	EPHEMERELLA	subvaria	276	6.4	
EPHEMEROPTERA	HEPTAGENIIDAE	imm	180	4.2	
EPHEMEROPTERA	EPEORUS	sp	12	0.3	
EPHEMEROPTERA	RHITHROGENA	sp	4	0.1	
EPHEMEROPTERA	STENONEMA	sp	304	7.0	
EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	72	1.7	
EPHEMEROPTERA	ISONYCHIA	sp	16	0.4	
TRICHOPTERA	MICRASEMA	sp	8	0.2	
TRICHOPTERA	GLOSSOSOMA	sp	68	1.6	
TRICHOPTERA	CHEUMATOPSYCHE	sp	512	11.8	
TRICHOPTERA	SYMPHITOPSYCHE	bronta	180	4.2	
TRICHOPTERA	SYMPHITOPSYCHE	morosa	72	1.7	
TRICHOPTERA	SYMPHITOPSYCHE	slossonae	204	4.7	
TRICHOPTERA	SYMPHITOPSYCHE	sparna	72	1.7	
TRICHOPTERA	SETODES	sp	4	0.1	
TRICHOPTERA	RHYACOPHILA	fuscula	8	0.2	
TRICHOPTERA	RHYACOPHILA	melita	8	0.2	
TRICHOPTERA	RHYACOPHILA	minora	44	1.0	
PLECOPTERA	CHLOROPERLIDAE	unid	0	0.0	
PLECOPTERA	ACRONEURIA	sp	4	0.1	
PLECOPTERA	AGNETINA	capitata	12	0.3	Northern Sone
PLECOPTERA	ISOPERLA	sp	184	4.3	
MEGALOPTERA	NIGRONIA	sp	4	0.1	
GASTROPODA	FERRISSIA	rivularis	16	0.4	Creeping ancylid
GASTROPODA	PHYSA	sp	4	0.1	Physa
GASTROPODA	GYRAULUS	parvus	48	1.1	Ash gyro

Dog River mi 7.0 Station 3

Order	Genera	Species	Density	PercentComp	CommonName
COLEOPTERA	OPTIOSERVUS	sp	308	5.2	
COLEOPTERA	OPTIOSERVUS	trivittatus	8	0.1	
COLEOPTERA	OPTIOSERVUS	ovalis	20	0.3	
COLEOPTERA	STENELMIS	sp	4	0.1	
DIPTERA	BEZZIA	group	20	0.3	
DIPTERA	CARDIOCLADIUS	obscurus	4	0.1	
DIPTERA	CRICOTOPUS	bisinctus	120	2.0	
DIPTERA	CRICOTOPUS	trifascia	24	0.4	
DIPTERA	CRYPTOCHIRONOMUS	sp	4	0.1	
DIPTERA	EUKIEFFERIELLA	devonica	20	0.3	
DIPTERA	EUKIEFFERIELLA	pseudomontana	44	0.7	
DIPTERA	MICROTENDIPES	sp	60	1.0	
DIPTERA	NANOCLADIUS	sp	8	0.1	
DIPTERA	PARAMETRIOCNEMUS	sp	8	0.1	
DIPTERA	POLYPEDILUM	convictum	140	2.4	
DIPTERA	POLYPEDILUM	aviceps	80	1.4	
DIPTERA	POTTHASTIA	gaedii	24	0.4	
DIPTERA	SUBLETTEA	sp	20	0.3	
DIPTERA	SYNORTHOCLADIUS	sp	44	0.7	
DIPTERA	THIENEMANNIELLA	sp	116	2.0	
DIPTERA	THIENEMANNEMYIA	group	172	2.9	
DIPTERA	TVETENIA	discoloripes	60	1.0	
DIPTERA	TVETENIA	bavarica	152	2.6	
DIPTERA	CRICOTOPUS/ORTHOCLAD	sp	232	3.9	
DIPTERA	EMPIDIDAE	unid	40	0.7	Aquatic Dance Fly
DIPTERA	SIMULIUM	tubersom	28	0.5	
DIPTERA	ANTOCHA	sp	68	1.2	
DIPTERA	HEXATOMA	sp	48	0.8	
EPHEMEROPTERA	BAETIDAE	imm	84	1.4	Small Minnow Mayfly
EPHEMEROPTERA	BAETIS	sp	28	0.5	
EPHEMEROPTERA	BAETIS	intercalaris	24	0.4	
EPHEMEROPTERA	ACENTRELLA	sp	288	4.9	
EPHEMEROPTERA	ACENTRELLA	turbida	108	1.8	
EPHEMEROPTERA	EPHEMERELLIDAE	imm	536	9.1	
EPHEMEROPTERA	EPHEMERELLA	subvaria	92	1.6	
EPHEMEROPTERA	HEPTAGENIIDAE	imm	52	0.9	
EPHEMEROPTERA	STENONEMA	sp	196	3.3	
EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	76	1.3	
TRICHOPTERA	BRACHYCENTRUS	lateralis	0	0.0	
TRICHOPTERA	MICRASEMA	rusticum	36	0.6	
TRICHOPTERA	GLOSSOSOMA	sp	168	2.9	
TRICHOPTERA	HYDROPSYCHIDAE	imm	104	1.8	Common Netspinner
TRICHOPTERA	CHEUMATOPSYCHE	sp	696	11.8	
TRICHOPTERA	SYMPHITOPSYCHE	bronta	412	7.0	
TRICHOPTERA	SYMPHITOPSYCHE	morosa	208	3.5	
TRICHOPTERA	SYMPHITOPSYCHE	slossonae	380	6.5	
TRICHOPTERA	SYMPHITOPSYCHE	sparna	132	2.2	
TRICHOPTERA	LEUCOTRICHIA	sp	16	0.3	
TRICHOPTERA	APATANIA	sp	4	0.1	Early Smoky Wing Sedge
TRICHOPTERA	GOERA	sp	4	0.1	Little Grey Sedge
TRICHOPTERA	DOLOPHILODES	sp	4	0.1	
TRICHOPTERA	RHYACOPHILA	fuscula	4	0.1	
TRICHOPTERA	RHYACOPHILA	melita	0	0.0	
TRICHOPTERA	RHYACOPHILA	minora	44	0.7	
PLECOPTERA	CHLOROPERLIDAE	unid	4	0.1	
PLECOPTERA	PARAGNETINA	immarginata	0	0.0	Beautiful Stone
PLECOPTERA	ISOGENOIDES	sp	4	0.1	
PLECOPTERA	ISOPERLA	sp	172	2.9	
GASTROPODA	FERRISSIA	rivularis	4	0.1	Creeping ancylid
GASTROPODA	PHYSA	sp	4	0.1	Physa
GASTROPODA	PHYSA	heterostropha	4	0.1	Pewter physa
GASTROPODA	GYRAULUS	parvus	4	0.1	Ash gyro
NEMATOMORPHA	UID		4	0.1	Horsehair worm
OLIGOCHAETA	NAIDIDAE	unid	8	0.1	
OLIGOCHAETA	TUBIFICIDAE	unid	4	0.1	
HYDRACHNIDIA	ATURUS	sp	4	0.1	
HYDRACHNIDIA	HYGROBATES	sp	24	0.4	
HYDRACHNIDIA	LEBERTIA	sp	20	0.3	
HYDRACHNIDIA	SPERCHON	sp	44	0.7	

Dog River mi 8.6, Station 4

Order	Genera	Species	Density	PercentComp	CommonName
COLEOPTERA	OPTIOSERVUS	sp	88	2.0	
COLEOPTERA	OPTIOSERVUS	trivittatus	4	0.1	
DIPTERA	BEZZIA	group	28	0.6	
DIPTERA	CARDIOCLADIUS	obscurus	12	0.3	
DIPTERA	CRICOTOPUS	spa	632	14.3	
DIPTERA	CRICOTOPUS	bisinctus	560	12.7	
DIPTERA	CRYPTOCHIRONOMUS	sp	12	0.3	
DIPTERA	DIAMESA	sp	4	0.1	
DIPTERA	EUKIEFFERIELLA	devonica	20	0.5	
DIPTERA	EUKIEFFERIELLA	pseudomontana	44	1.0	
DIPTERA	MICROTENDIPES	sp	40	0.9	
DIPTERA	NANOCLADIUS	sp	48	1.1	
DIPTERA	ORTHOCLADIUS	sp	36	0.8	
DIPTERA	PARAMETRIOCNEMUS	sp	160	3.6	
DIPTERA	POLYPEDILUM	convictum	84	1.9	
DIPTERA	POLYPEDILUM	aviceps	340	7.7	
DIPTERA	POTTHASTIA	gaedii	32	0.7	
DIPTERA	RHEOTANYTARSUS	exiguus	8	0.2	
DIPTERA	SUBLETTEA	sp	20	0.5	
DIPTERA	SYNORTHOCLADIUS	sp	28	0.6	
DIPTERA	TANYTARSUS	sp	4	0.1	
DIPTERA	THIENEMANNIELLA	sp	116	2.6	
DIPTERA	THIENEMANNEMYIA	group	184	4.2	
DIPTERA	TVETENIA	discoloripes	16	0.4	
DIPTERA	TVETENIA	bavarica	92	2.1	
DIPTERA	EMPIDIDAE	unid	120	2.7	Aquatic Dance Fly
DIPTERA	MUSCIDAE	unid	4	0.1	Aquatic Muscid
DIPTERA	SIMULIUM	tubersom	4	0.1	
DIPTERA	SIMULIUM	vittatum	180	4.1	
DIPTERA	ANTOCHA	sp	132	3.0	
EPHEMEROPTERA	EPHEMERELLA	subvaria	44	1.0	
EPHEMEROPTERA	EURYLOPHELLA	sp	4	0.1	
EPHEMEROPTERA	HEPTAGENIIDAE	imm	16	0.4	
EPHEMEROPTERA	STENONEMA	luteum	24	0.5	
EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	36	0.8	
TRICHOPTERA	BRACHYCENTRUS	lateralis	16	0.4	
TRICHOPTERA	MICRASEMA	sp	4	0.1	
TRICHOPTERA	GLOSSOSOMA	sp	32	0.7	
TRICHOPTERA	HELICOPSYCHE	borealis	4	0.1	
TRICHOPTERA	CHEUMATOPSYCHE	sp	256	5.8	
TRICHOPTERA	SYMPHITOPSYCHE	bronta	84	1.9	
TRICHOPTERA	SYMPHITOPSYCHE	morosa	64	1.4	
TRICHOPTERA	SYMPHITOPSYCHE	slossonae	456	10.3	
TRICHOPTERA	SYMPHITOPSYCHE	sparna	112	2.5	
TRICHOPTERA	LEUCOTRICHIA	sp	4	0.1	
TRICHOPTERA	LEPIDOSTOMA	sp	8	0.2	Little Plain Brown Sedge
PLECOPTERA	CHLOROPERLIDAE	unid	4	0.1	
PLECOPTERA	LEUCTRIDAE	unid	4	0.1	Needlefly
PLECOPTERA	ACRONEURIA	abnormis	0	0.0	Common Stone
PLECOPTERA	PARAGNETINA	immarginata	4	0.1	Beautiful Stone
PLECOPTERA	AGNETINA	capitata	4	0.1	Northern Sone
PLECOPTERA	MALIREKUS	sp	4	0.1	
GASTROPODA	PHYSA	sp	120	2.7	Physa
GASTROPODA	GYRAULUS	parvus	8	0.2	Ash gyro
OLIGOCHAETA	NAIDIDAE	unid	12	0.3	
OLIGOCHAETA	TUBIFICIDAE	unid	4	0.1	
HIRUDINEA	NEPHELOPSIS	obscura	12	0.3	
HYDRACHNIDIA	HYGROBATES	sp	16	0.4	
HYDRACHNIDIA	LEBERTIA	sp	12	0.3	
HYDRACHNIDIA	SPERCHON	sp	4	0.1	

Dog River mi 14.8, Station 5

Order	Genera	Species	Density	PercentComp	CommonName
COLEOPTERA	OPTIOSERVUS	sp	4	0.2	
COLEOPTERA	OPTIOSERVUS	ovalis	0	0.0	
COLEOPTERA	PROMORESIA	tardella	4	0.2	
COLEOPTERA	STENELMIS	crenata	4	0.2	
DIPTERA	ATHERIX	sp	8	0.4	
DIPTERA	BEZZIA	group	12	0.6	
DIPTERA	CRICOTOPUS	spa	4	0.2	
DIPTERA	EUKIEFFERIELLA	devonica	4	0.2	
DIPTERA	PARACHAETOCLADIUS	sp	4	0.2	
DIPTERA	POLYPEDILUM	illionoense	4	0.2	
DIPTERA	POLYPEDILUM	aviceps	260	12.7	
DIPTERA	THIENEMANNEMYIA	group	12	0.6	
DIPTERA	TVETENIA	bavarica	40	1.9	
DIPTERA	MICROPSECTRA	sp	12	0.6	
DIPTERA	SIMULIUM	tubersom	24	1.2	
DIPTERA	DICRANOTA	sp	4	0.2	
DIPTERA	HEXATOMA	sp	12	0.6	
EPHEMEROPTERA	BAETIDAE	imm	12	0.6	Small Minnow Mayfly
EPHEMEROPTERA	BAETIS	tricaudatus	4	0.2	
EPHEMEROPTERA	EPHEMERELLA	sp	172	8.4	
EPHEMEROPTERA	EPHEMERELLA	subvaria	16	0.8	
EPHEMEROPTERA	HEPTAGENIIDAE	imm	36	1.8	
EPHEMEROPTERA	EPEORUS	sp	108	5.3	
EPHEMEROPTERA	RHITHROGENA	sp	20	1.0	
EPHEMEROPTERA	STENONEMA	sp	8	0.4	
EPHEMEROPTERA	STENONEMA	luteum	4	0.2	
EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	96	4.7	
TRICHOPTERA	BRACHYCENTRUS	americanus	96	4.7	
TRICHOPTERA	BRACHYCENTRUS	lateralis	4	0.2	
TRICHOPTERA	CHEUMATOPSYCHE	sp	112	5.5	
TRICHOPTERA	SYMPHITOPSYCHE	morosa	40	1.9	
TRICHOPTERA	SYMPHITOPSYCHE	slossonae	288	14.0	
TRICHOPTERA	SYMPHITOPSYCHE	sparna	68	3.3	
TRICHOPTERA	DOLOPHILODES	sp	256	12.5	
TRICHOPTERA	RHYACOPHILA	fuscula	48	2.3	
TRICHOPTERA	RHYACOPHILA	carolina	0	0.0	
TRICHOPTERA	RHYACOPHILA	acutiloba	24	1.2	
PLECOPTERA	CHLOROPERLIDAE	unid	120	5.8	
PLECOPTERA	PARAGNETINA	immarginata	12	0.6	Beautiful Stone
PLECOPTERA	AGNETINA	capitata	12	0.6	Northern Sone
PLECOPTERA	ISOGENOIDES	sp	12	0.6	
PLECOPTERA	ISOPERLA	sp	28	1.4	
PLECOPTERA	PTERONARCYS	sp	4	0.2	Giant Stoneflies
PLECOPTERA	TAENIOPTERYX	sp	20	1.0	
MEGALOPTERA	NIGRONIA	sp	4	0.2	
LEPIDOPTERA	ARCHIPS	sp	4	0.2	
HYDRACHNIDIA	HYGROBATES	sp	4	0.2	
HYDRACHNIDIA	LEBERTIA	sp	8	0.4	
HEMIPTERA	RHAGOVELIA	sp	0	0.0	

Poultney River mi 31.9, Station 1

Order	Genera	Species	Density	PercentComp	CommonName
COLEOPTERA	OPTIOSERVUS	sp	48	1.6	
COLEOPTERA	OPTIOSERVUS	ovalis	12	0.4	
COLEOPTERA	PROMORESIA	tardella	8	0.3	
COLEOPTERA	STENELMIS	crenata	4	0.1	
COLEOPTERA	PSEPHENUS	herricki	32	1.0	
DIPTERA	ATHERIX	sp	20	0.7	
DIPTERA	BEZZIA	group	16	0.5	
DIPTERA	CRICOTOPUS	spa	24	0.8	
DIPTERA	CRICOTOPUS	bisinctus	72	2.3	
DIPTERA	CRICOTOPUS	trifascia	12	0.4	
DIPTERA	EUKIEFFERIELLA	devonica	8	0.3	
DIPTERA	EUKIEFFERIELLA	pseudomontana	4	0.1	
DIPTERA	ORTHOCLADIUS	sp	64	2.1	
DIPTERA	PARAMETRIOCNEMUS	sp	20	0.7	
DIPTERA	POLYPEDILUM	aviceps	44	1.4	
DIPTERA	RHEOTANYTARSUS	sp	16	0.5	
DIPTERA	STEMPELLINELLA	sp	4	0.1	
DIPTERA	SYNORTHOCLADIUS	sp	8	0.3	
DIPTERA	THIENEMANNIELLA	sp	32	1.0	
DIPTERA	THIENEMANNEMYIA	group	92	3.0	
DIPTERA	TVETENIA	discoloripes	12	0.4	
DIPTERA	TVETENIA	bavarica	4	0.1	
DIPTERA	MICROPSECTRA	sp	8	0.3	
DIPTERA	SIMULIUM	tubersom	4	0.1	
DIPTERA	ANTOCHA	sp	32	1.0	
DIPTERA	HEXATOMA	sp	28	0.9	
EPHEMEROPTERA	BAETIS	flavistriga	4	0.1	
EPHEMEROPTERA	ACENTRELLA	sp	36	1.2	
EPHEMEROPTERA	ACENTRELLA	turbida	8	0.3	
EPHEMEROPTERA	CAENIS	sp	4	0.1	
EPHEMEROPTERA	EPHEMERELLIDAE	imm	28	0.9	
EPHEMEROPTERA	EPHEMERELLA	subvaria	456	14.8	
EPHEMEROPTERA	EURYLOPHELLA	sp	8	0.3	
EPHEMEROPTERA	HEPTAGENIIDAE	unid	12	0.4	Flatheaded Mayfly
EPHEMEROPTERA	STENONEMA	sp	124	4.0	
EPHEMEROPTERA	STENONEMA	luteum	20	0.7	
EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	216	7.0	
TRICHOPTERA	BRACHYCENTRUS	lateralis	12	0.4	
TRICHOPTERA	MICRASEMA	rusticum	136	4.4	
TRICHOPTERA	HELICOPSYCHE	borealis	312	10.1	
TRICHOPTERA	SYMPHITOPSYCHE	bronta	84	2.7	
TRICHOPTERA	SYMPHITOPSYCHE	morosa	180	5.9	
TRICHOPTERA	SYMPHITOPSYCHE	slossonae	412	13.4	
TRICHOPTERA	SYMPHITOPSYCHE	sparna	120	3.9	
TRICHOPTERA	LEPIDOSTOMA	sp	24	0.8	Little Plain Brown Sedge
TRICHOPTERA	PSILOTRETA	sp	8	0.3	Dark Blue Sedge
TRICHOPTERA	DOLOPHILODES	sp	12	0.4	
TRICHOPTERA	RHYACOPHILA	fuscula	36	1.2	
TRICHOPTERA	RHYACOPHILA	melita	4	0.1	
TRICHOPTERA	RHYACOPHILA	acutiloba	4	0.1	
PLECOPTERA	CHLOROPERLIDAE	unid	8	0.3	
PLECOPTERA	PARAGNETINA	immarginata	16	0.5	Beautiful Stone
PLECOPTERA	AGNETINA	capitata	16	0.5	Northern Sone
PLECOPTERA	ISOPERLA	sp	56	1.8	
PLECOPTERA	ISOPERLA	lata	4	0.1	Dark Stripetail
PLECOPTERA	PTERONARCYS	sp	8	0.3	Giant Stoneflies
ODONATA	OPHIOGOMPHUS	sp	16	0.5	Snaketail
GASTROPODA	PHYSA	gyrina	8	0.3	Tadpole physa
TRICLADIDA	CURA	foremanii	52	1.7	
HYDRACHNIDIA	SPERCHON	sp	4	0.1	

Poultney River mi 32.9, Station 2

Order	Genera	Species	Density	Percent Comp	Common Name
COLEOPTERA	OPTIOSERVUS	sp	128	4.3	
COLEOPTERA	OPTIOSERVUS	ovalis	28	0.9	
COLEOPTERA	PSEPHENUS	herricki	20	0.7	
DIPTERA	ATHERIX	sp	8	0.3	
DIPTERA	BEZZIA	group	12	0.4	
DIPTERA	CORYNONEURA	sp	8	0.3	
DIPTERA	CRICOTOPUS	spa	32	1.1	
DIPTERA	CRICOTOPUS	bisinctus	24	0.8	
DIPTERA	CRICOTOPUS	trifascia	8	0.3	
DIPTERA	EUKIEFFERIELLA	pseudomontana	28	0.9	
DIPTERA	MICROTENDIPES	sp	48	1.6	
DIPTERA	NANOCLADIUS	sp	4	0.1	
DIPTERA	NILOTHAUMA	baybyii	16	0.5	
DIPTERA	ORTHOCLADIUS	sp	36	1.2	
DIPTERA	PARAMETRIOCNEMUS	sp	24	0.8	
DIPTERA	POLYPEDILUM	illionoense	8	0.3	
DIPTERA	RHEOTANYTARSUS	sp	8	0.3	
DIPTERA	SUBLETTEA	sp	32	1.1	
DIPTERA	SYNORTHOCLADIUS	sp	4	0.1	
DIPTERA	THIENEMANNEMYIA	group	76	2.6	
DIPTERA	TVETENIA	bavarica	16	0.5	
DIPTERA	ZAVRELIA	sp	8	0.3	
DIPTERA	EMPIDIDAE	unid	4	0.1	Aquatic Dance Fly
DIPTERA	ANTOCHA	sp	108	3.6	
DIPTERA	DICRANOTA	sp	4	0.1	
DIPTERA	HEXATOMA	sp	16	0.5	
DIPTERA	PSEUDOLIMNOPHILA	sp	4	0.1	
EPHEMEROPTERA	ACENTRELLA	turbida	20	0.7	
EPHEMEROPTERA	ACENTRELLA	cingulatum	32	1.1	
EPHEMEROPTERA	BAETISCA	sp	4	0.1	
EPHEMEROPTERA	CAENIS	sp	4	0.1	
EPHEMEROPTERA	EPHEMERELLIDAE	imm	216	7.3	
EPHEMEROPTERA	EPHEMERELLA	subvaria	84	2.8	
EPHEMEROPTERA	HEPTAGENIIDAE	imm	96	3.2	
EPHEMEROPTERA	EPEORUS	sp	60	2.0	
EPHEMEROPTERA	RHITHROGENA	sp	4	0.1	
EPHEMEROPTERA	STENONEMA	sp	56	1.9	
EPHEMEROPTERA	STENONEMA	luteum	28	0.9	
EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	164	5.5	
EPHEMEROPTERA	ISONYCHIA	sp	32	1.1	
TRICHOPTERA	BRACHYCENTRUS	lateralis	56	1.9	
TRICHOPTERA	MICRASEMA	rusticum	260	8.7	
TRICHOPTERA	GLOSSOSOMA	sp	16	0.5	
TRICHOPTERA	HELICOPSYCHE	borealis	296	10.0	
TRICHOPTERA	CHEUMATOPSYCHE	sp	88	3.0	
TRICHOPTERA	SYMPHITOPSYCHE	bronta	20	0.7	
TRICHOPTERA	SYMPHITOPSYCHE	morosa	88	3.0	
TRICHOPTERA	SYMPHITOPSYCHE	slossonae	300	10.1	
TRICHOPTERA	SYMPHITOPSYCHE	sparna	128	4.3	
TRICHOPTERA	LEUCOTRICHIA	sp	4	0.1	
TRICHOPTERA	LEPIDOSTOMA	sp	48	1.6	Little Plain Brown Sedge
TRICHOPTERA	SETODES	sp	12	0.4	
TRICHOPTERA	PSILOTRETA	sp	48	1.6	Dark Blue Sedge
TRICHOPTERA	DOLOPHILODES	sp	4	0.1	
TRICHOPTERA	POLYCENTROPUS	sp	8	0.3	Brown Checkered Simmer Sedge
TRICHOPTERA	RHYACOPHILA	acutiloba	8	0.3	
PLECOPTERA	CAPNIIDAE	unid	4	0.1	
PLECOPTERA	CHLOROPERLIDAE	unid	8	0.3	
PLECOPTERA	AGNETINA	capitata	12	0.4	Northern Sone
PLECOPTERA	ISOPERLA	sp	16	0.5	
PLECOPTERA	PTERONARCYS	sp	0	0.0	Giant Stoneflies
ODONATA	GOMPHIDAE	unid	12	0.4	Clubtail
GASTROPODA	PHYSA	gyrina	8	0.3	Tadpole physa
HYDRACHNIDIA	HYGROBATES	sp	4	0.1	
HYDRACHNIDIA	SPERCHON	sp	12	0.4	

Castleton River mi 4.8, Station 1

Order	Genera	Species	Density	PercentComp	CommonName
COLEOPTERA	DUBIRAPHIA	sp	104	4.5	
COLEOPTERA	DUBIRAPHIA	quadrinotata	8	0.3	
COLEOPTERA	DUBIRAPHIA	minima	20	0.9	
COLEOPTERA	MACRONYCHUS	glabratus	16	0.7	
COLEOPTERA	HALIPLUS	immaculicollis	4	0.2	
COLEOPTERA	PELTODYTES	edentulus	96	4.2	
DIPTERA	BEZZIA	sp	4	0.2	
DIPTERA	CORYNONEURA	sp	8	0.3	
DIPTERA	CRICOTOPUS	spa	80	3.5	
DIPTERA	CRICOTOPUS	sylvestris	40	1.7	
DIPTERA	DICROTENDIPES	neomodestus	300	13.1	
DIPTERA	MICROTENDIPES	sp	4	0.2	
DIPTERA	PARATANYTARSUS	sp	120	5.2	
DIPTERA	PROCLADIUS	sp	60	2.6	
DIPTERA	STENOCHIRONOMUS	sp	4	0.2	
DIPTERA	TANYTARSUS	sp	12	0.5	
DIPTERA	THIENEMANNIELLA	sp	12	0.5	
DIPTERA	THIENEMANNEMYIA	group	8	0.3	
DIPTERA	CHRYSOPS	sp	4	0.2	
EPHEMEROPTERA	BAETIDAE	unid	144	6.3	Armored Mayfly
EPHEMEROPTERA	EPHEMERELLIDAE	imm	4	0.2	
EPHEMEROPTERA	LEPTOPHLEBIIDAE	imm	20	0.9	Pronggills
TRICHOPTERA	GLOSSOSOMA	sp	8	0.3	
TRICHOPTERA	SYMPHITOPSYCHE	slossonae	8	0.3	
TRICHOPTERA	LEPIDOSTOMA	sp	8	0.3	Little Plain Brown Sedge
TRICHOPTERA	MYSTACIDES	sp	28	1.2	
TRICHOPTERA	NECTOPSYCHE	albida	28	1.2	
TRICHOPTERA	OECETIS	sp	8	0.3	
TRICHOPTERA	SETODES	sp	24	1.0	
TRICHOPTERA	LIMNEPHILUS	sp	36	1.6	Summer Flier Sedge
TRICHOPTERA	PHRYGANEA	sp	8	0.3	Rush Sedge
TRICHOPTERA	POLYCENTROPUS	sp	8	0.3	Brown Checkered Simmer Sedge
ODONATA	BASIAESCHNA	janta	8	0.3	Springtime Darner
ODONATA	CALOPTERYX	sp	8	0.3	Bandwing
ODONATA	ENALLAGMA	sp	440	19.2	Bluet
ODONATA	GOMPHUS	sp	0	0.0	Clubtail
MEGALOPTERA	SIALIS	sp	0	0.0	Alderfly
LEPIDOPTERA	ACENTRIA	sp	12	0.5	
AMPHIPODA	HYALLELA	azteca	120	5.2	scud
ISOPODA	ASELLUS	sp	16	0.7	
ISOPODA	ASELLUS	communis	32	1.4	
GASTROPODA	AMNICOLA	limosa	52	2.3	Mud amnicola
GASTROPODA	PHYSA	sp	20	0.9	Physa
GASTROPODA	GYRAULUS	parvus	4	0.2	Ash gyro
BIVALVIA	PISIDIUM	compressum	4	0.2	
OLIGOCHAETA	TUBIFICIDAE	unid	8	0.3	
HEMIPTERA	CORIXIDAE	unid	300	13.1	Water Boartmen
HEMIPTERA	BELOSTOMA	sp	20	0.9	
HEMIPTERA	RANATRA	fusca	8	0.3	
HEMIPTERA	NOTONECTA	sp	0	0.0	

Castleton River mi 9.6, Station 2

Order	Genera	Species	Density	PercentComp	CommonName
COLEOPTERA	OPTIOSERVUS	sp	110	3.2	
COLEOPTERA	OPTIOSERVUS	trivittatus	4	0.1	
COLEOPTERA	OPTIOSERVUS	ovalis	36	1.1	
COLEOPTERA	OULIMNIUS	latiusculus	4	0.1	
COLEOPTERA	PROMORESIA	tardella	128	3.7	
COLEOPTERA	STENELMIS	crenata	6	0.2	
DIPTERA	BEZZIA	group	4	0.1	
DIPTERA	CORYNONEURA	sp	2	0.1	
DIPTERA	CRICOTOPUS	spa	168	4.9	
DIPTERA	DIAMESA	sp	4	0.1	
DIPTERA	EUKIEFFERIELLA	devonica	40	1.2	
DIPTERA	EUKIEFFERIELLA	brehmi	14	0.4	
DIPTERA	EUKIEFFERIELLA	claripennis	56	1.6	
DIPTERA	LIMNOPHYES	sp	8	0.2	
DIPTERA	ORTHOCLADIUS	sp	16	0.5	
DIPTERA	PARAMETRIOCNEMUS	sp	84	2.5	
DIPTERA	POTTHASTIA	gaedii	8	0.2	
DIPTERA	RHEOCRICOTOPUS	sp	8	0.2	
DIPTERA	RHEOTANYTARSUS	sp	22	0.6	
DIPTERA	SYNORTHOCLADIUS	sp	2	0.1	
DIPTERA	THIENEMANNIELLA	sp	32	0.9	
DIPTERA	THIENEMANNEMYIA	group	30	0.9	
DIPTERA	TVETENIA	discoloripes	8	0.2	
DIPTERA	TVETENIA	bavarica	852	24.9	
DIPTERA	MICROPSECTRA	sp	434	12.7	
DIPTERA	EMPIDIDAE	unid	40	1.2	Aquatic Dance Fly
DIPTERA	SIMULIUM	tubersom	8	0.2	
DIPTERA	ANTOCHA	sp	2	0.1	
DIPTERA	DICRANOTA	sp	10	0.3	
DIPTERA	HEXATOMA	sp	8	0.2	
DIPTERA	TIPULA	sp	2	0.1	
EPHEMEROPTERA	BAETIDAE	imm	30	0.9	Small Minnow Mayfly
EPHEMEROPTERA	BAETIS	sp	22	0.6	
EPHEMEROPTERA	BAETIS	flavistriga	2	0.1	
EPHEMEROPTERA	BAETIS	tricaudatus	18	0.5	
EPHEMEROPTERA	EPHEMERELLIDAE	unid	8	0.2	Spiny Crawlers
EPHEMEROPTERA	EPHEMERELLIDAE	imm	114	3.3	
EPHEMEROPTERA	EPHEMERELLA	subvaria	2	0.1	
EPHEMEROPTERA	HEPTAGENIIDAE	imm	10	0.3	
EPHEMEROPTERA	EPEORUS	sp	6	0.2	
EPHEMEROPTERA	RHITHROGENA	sp	10	0.3	
EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	270	7.9	
EPHEMEROPTERA	TRICORYTHODES	sp	12	0.4	
TRICHOPTERA	BRACHYCENTRUS	americanus	72	2.1	
TRICHOPTERA	MICRASEMA	rusticum	80	2.3	
TRICHOPTERA	SYMPHITOPSYCHE	bronta	6	0.2	
TRICHOPTERA	SYMPHITOPSYCHE	slossonae	194	5.7	
TRICHOPTERA	SYMPHITOPSYCHE	sparna	60	1.8	
TRICHOPTERA	HYDROPTILA	sp	6	0.2	
TRICHOPTERA	LEPIDOSTOMA	sp	4	0.1	Little Plain Brown Sedge
TRICHOPTERA	DOLOPHILODES	sp	10	0.3	
TRICHOPTERA	RHYACOPHILA	fuscula	94	2.8	
TRICHOPTERA	RHYACOPHILA	acutiloba	42	1.2	
PLECOPTERA	CHLOROPERLIDAE	unid	2	0.1	
PLECOPTERA	LEUCTRIDAE	unid	2	0.1	Needlefly
PLECOPTERA	PELTOPERLA	sp	2	0.1	Roachfly
PLECOPTERA	ACRONEURIA	sp	10	0.3	
PLECOPTERA	ISOPERLA	sp	90	2.6	
PLECOPTERA	ISOPERLA	lata	14	0.4	Dark Stripetail
PLECOPTERA	MALIREKUS	sp	4	0.1	
PLECOPTERA	TAENIOPTERYX	sp	60	1.8	
PLECOPTERA	TAENIONEMA	sp	2	0.1	Atlantic Willowfly
OLIGOCHAETA	ENCHYTRAEIDAE	unid	8	0.2	Potworm

Mettawee River mi 23.6, Station 1

Order	Genera	Species	Density	PercentComp	CommonName
COLEOPTERA	OPTIOSERVUS	sp	316	12.0	
COLEOPTERA	OPTIOSERVUS	trivittatus	28	1.1	
COLEOPTERA	OPTIOSERVUS	ovalis	4	0.2	
COLEOPTERA	STENELMIS	sp	12	0.5	
COLEOPTERA	STENELMIS	crenata	4	0.2	
COLEOPTERA	PSEPHENUS	herricki	128	4.8	
DIPTERA	ATHERIX	sp	12	0.5	
DIPTERA	EUKIEFFERIELLA	devonica	12	0.5	
DIPTERA	EUKIEFFERIELLA	pseudomontana	4	0.2	
DIPTERA	MICROTENDIPES	sp	12	0.5	
DIPTERA	PARAMETRIOCNEMUS	sp	36	1.4	
DIPTERA	POLYPEDILUM	convictum	84	3.2	
DIPTERA	POLYPEDILUM	aviceps	92	3.5	
DIPTERA	THIENEMANNIELLA	sp	8	0.3	
DIPTERA	THIENEMANNEMYIA	group	24	0.9	
DIPTERA	TVETENIA	discoloripes	16	0.6	
DIPTERA	TVETENIA	bavarica	52	2.0	
DIPTERA	MICROPSECTRA	sp	12	0.5	
DIPTERA	EMPIDIDAE	unid	12	0.5	Aquatic Dance Fly
DIPTERA	SIMULIUM	tubersom	8	0.3	
DIPTERA	ANTOCHA	sp	4	0.2	
DIPTERA	HEXATOMA	sp	8	0.3	
DIPTERA	PSEUDOLIMNOPHILA	sp	4	0.2	
EPHEMEROPTERA	BAETIDAE	imm	24	0.9	Small Minnow Mayfly
EPHEMEROPTERA	BAETIS	flavistriga	4	0.2	
EPHEMEROPTERA	BAETIS	intercalaris	4	0.2	
EPHEMEROPTERA	ACENTRELLA	sp	76	2.9	
EPHEMEROPTERA	ACENTRELLA	turbida	8	0.3	
EPHEMEROPTERA	EPHEMERELLIDAE	imm	248	9.4	
EPHEMEROPTERA	EPHEMERELLA	sp	12	0.5	
EPHEMEROPTERA	EPHEMERELLA	subvaria	4	0.2	
EPHEMEROPTERA	HEPTAGENIIDAE	imm	40	1.5	
EPHEMEROPTERA	EPEORUS	sp	8	0.3	
EPHEMEROPTERA	STENONEMA	sp	20	0.8	
EPHEMEROPTERA	STENONEMA	luteum	4	0.2	
EPHEMEROPTERA	LEPTOPHLEBIIDAE	imm	44	1.7	Pronggills
EPHEMEROPTERA	ISONYCHIA	sp	12	0.5	
TRICHOPTERA	MICRASEMA	rusticum	28	1.1	
TRICHOPTERA	HELICOPSYCHE	borealis	552	20.9	
TRICHOPTERA	CHEUMATOPSYCHE	sp	232	8.8	
TRICHOPTERA	SYMPHITOPSYCHE	bronta	24	0.9	
TRICHOPTERA	SYMPHITOPSYCHE	morosa	140	5.3	
TRICHOPTERA	SYMPHITOPSYCHE	sparna	52	2.0	
TRICHOPTERA	LEPIDOSTOMA	sp	28	1.1	Little Plain Brown Sedge
TRICHOPTERA	DOLOPHILODES	sp	124	4.7	
TRICHOPTERA	RHYACOPHILA	fuscula	24	0.9	
TRICHOPTERA	RHYACOPHILA	melita	4	0.2	
TRICHOPTERA	RHYACOPHILA	acutiloba	4	0.2	
PLECOPTERA	CHLOROPERLIDAE	unid	4	0.2	
PLECOPTERA	AGNETINA	capitata	12	0.5	Northern Sone
OLIGOCHAETA	LUMBRICULIDAE	unid	8	0.3	
HYDRACHNIDIA	SPERCHON	sp	4	0.2	

Mettauwee River mi 32.5, Station 2

Order	Genera	Species	Density	PercentComp	CommonName
COLEOPTERA	OPTIOSERVUS	sp	200	10.1	
COLEOPTERA	OPTIOSERVUS	trivittatus	4	0.2	
COLEOPTERA	OPTIOSERVUS	ovalis	32	1.6	
COLEOPTERA	OULIMNIUS	latiusculus	4	0.2	
COLEOPTERA	PROMORESIA	tardella	4	0.2	
DIPTERA	BEZZIA	group	8	0.4	
DIPTERA	CORYNONEURA	sp	52	2.6	
DIPTERA	CRICOTOPUS	spa	84	4.2	
DIPTERA	CRICOTOPUS	bisinctus	64	3.2	
DIPTERA	CRICOTOPUS	trifascia	48	2.4	
DIPTERA	EUKIEFFERIELLA	devonica	16	0.8	
DIPTERA	EUKIEFFERIELLA	claripennis	4	0.2	
DIPTERA	HELENIELLA	sp	8	0.4	
DIPTERA	MICROTENDIPES	sp	4	0.2	
DIPTERA	PARACHAETOCLADIUS	sp	4	0.2	
DIPTERA	POLYPEDILUM	aviceps	48	2.4	
DIPTERA	POTTHASTIA	gaedii	24	1.2	
DIPTERA	RHEOCRICOTOPUS	sp	4	0.2	
DIPTERA	RHEOTANYTARSUS	distinctissimus	64	3.2	
DIPTERA	SYNORTHOCLADIUS	sp	12	0.6	
DIPTERA	THIENEMANNIELLA	sp	12	0.6	
DIPTERA	THIENEMANNEMYIA	group	40	2.0	
DIPTERA	TVETENIA	bavarica	16	0.8	
DIPTERA	EMPIDIDAE	unid	8	0.4	Aquatic Dance Fly
DIPTERA	SIMULIUM	tubersom	16	0.8	
DIPTERA	ANTOCHA	sp	16	0.8	
DIPTERA	HEXATOMA	sp	12	0.6	
DIPTERA	PSEUDOLIMNOPHILA	sp	4	0.2	
EPHEMEROPTERA	BAETIDAE	imm	16	0.8	Small Minnow Mayfly
EPHEMEROPTERA	BAETIS	tricaudatus	16	0.8	
EPHEMEROPTERA	ACENTRELLA	sp	68	3.4	
EPHEMEROPTERA	ACENTRELLA	turbida	148	7.4	
EPHEMEROPTERA	EPHEMERELLA	subvaria	12	0.6	
EPHEMEROPTERA	HEPTAGENIIDAE	imm	56	2.8	
EPHEMEROPTERA	EPEORUS	sp	12	0.6	
EPHEMEROPTERA	RHITHROGENA	sp	12	0.6	
EPHEMEROPTERA	STENONEMA	sp	8	0.4	
EPHEMEROPTERA	STENONEMA	luteum	16	0.8	
EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	224	11.3	
TRICHOPTERA	BRACHYCENTRUS	americanus	60	3.0	
TRICHOPTERA	BRACHYCENTRUS	lateralis	16	0.8	
TRICHOPTERA	MICRASEMA	sp	68	3.4	
TRICHOPTERA	GLOSSOSOMA	sp	4	0.2	
TRICHOPTERA	SYMPHITOPSYCHE	bronta	12	0.6	
TRICHOPTERA	SYMPHITOPSYCHE	slossonae	56	2.8	
TRICHOPTERA	SYMPHITOPSYCHE	sparna	28	1.4	
TRICHOPTERA	LEPIDOSTOMA	sp	112	5.6	Little Plain Brown Sedge
TRICHOPTERA	SETODES	sp	4	0.2	
TRICHOPTERA	PSILOTRETA	sp	0	0.0	Dark Blue Sedge
TRICHOPTERA	RHYACOPHILA	fuscula	8	0.4	
TRICHOPTERA	RHYACOPHILA	atrata	20	1.0	
TRICHOPTERA	RHYACOPHILA	carolina spa	24	1.2	
TRICHOPTERA	RHYACOPHILA	acutiloba	0	0.0	
TRICHOPTERA	RHYACOPHILA	carolina group	4	0.2	
PLECOPTERA	CHLOROPERLIDAE	unid	28	1.4	
PLECOPTERA	LEUCTRIDAE	unid	4	0.2	Needlefly
PLECOPTERA	PELTOPERLA	sp	4	0.2	Roachfly
PLECOPTERA	AGNETINA	capitata	8	0.4	Northern Sone
PLECOPTERA	ISOGENOIDES	sp	12	0.6	
PLECOPTERA	ISOPERLA	sp	88	4.4	
PLECOPTERA	PTERONARCYS	sp	0	0.0	Giant Stoneflies
OLIGOCHAETA	LUMBRICULIDAE	unid	12	0.6	
HYDRACHNIDIA	LEBERTIA	sp	4	0.2	
HYDRACHNIDIA	SPERCHON	sp	12	0.6	

Batten Kill mi 32.9, Station 1

Order	Genera	Species	Density	PercentComp	CommonName
COLEOPTERA	OPTIOSERVUS	sp	136	5.1	
COLEOPTERA	OPTIOSERVUS	trivittatus	4	0.1	
COLEOPTERA	OULIMNIUS	latiusculus	4	0.1	
COLEOPTERA	PROMORESIA	elegans	8	0.3	
COLEOPTERA	PROMORESIA	tardella	12	0.4	
COLEOPTERA	PSEPHENUS	herricki	8	0.3	
DIPTERA	ATHERIX	sp	8	0.3	
DIPTERA	CORYNONEURA	sp	16	0.6	
DIPTERA	CRICOTOPUS	spa	20	0.7	
DIPTERA	CRICOTOPUS	bisinctus	24	0.9	
DIPTERA	CRICOTOPUS	trifascia	28	1.0	
DIPTERA	MICROTENDIPES	sp	20	0.7	
DIPTERA	PARAMETRIOCNEMUS	sp	28	1.0	
DIPTERA	POLYPEDILUM	aviceps	220	8.2	
DIPTERA	POTTHASTIA	gaedii	40	1.5	
DIPTERA	RHEOTANYTARSUS	distinctissimus	32	1.2	
DIPTERA	THIENEMANNIELLA	sp	8	0.3	
DIPTERA	TVETENIA	bavarica	80	3.0	
DIPTERA	EMPIDIDAE	unid	12	0.4	Aquatic Dance Fly
DIPTERA	SIMULIUM	tubersom	16	0.6	
DIPTERA	HEXATOMA	sp	4	0.1	
EPHEMEROPTERA	BAETIS	tricaudatus	4	0.1	
EPHEMEROPTERA	ACENTRELLA	sp	8	0.3	
EPHEMEROPTERA	ACENTRELLA	turbida	44	1.6	
EPHEMEROPTERA	ACENTRELLA	cingulatum	136	5.1	
EPHEMEROPTERA	EPHEMERELLIDAE	imm	24	0.9	
EPHEMEROPTERA	EPHEMERELLA	subvaria	112	4.2	
EPHEMEROPTERA	HEPTAGENIIDAE	imm	8	0.3	
EPHEMEROPTERA	EPEORUS	sp	48	1.8	
EPHEMEROPTERA	STENONEMA	sp	20	0.7	
EPHEMEROPTERA	STENONEMA	luteum	4	0.1	
EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	332	12.3	
EPHEMEROPTERA	ISONYCHIA	sp	12	0.4	
TRICHOPTERA	BRACHYCENTRUS	americanus	4	0.1	
TRICHOPTERA	MICRASEMA	sp	4	0.1	
TRICHOPTERA	CHEUMATOPSYCHE	sp	308	11.4	
TRICHOPTERA	SYMPHITOPSYCHE	bronta	52	1.9	
TRICHOPTERA	SYMPHITOPSYCHE	morosa	116	4.3	
TRICHOPTERA	SYMPHITOPSYCHE	slossonae	32	1.2	
TRICHOPTERA	SYMPHITOPSYCHE	sparna	28	1.0	
TRICHOPTERA	LEPIDOSTOMA	sp	52	1.9	Little Plain Brown Sedge
TRICHOPTERA	SETODES	sp	12	0.4	
TRICHOPTERA	GOERA	sp	12	0.4	Little Grey Sedge
TRICHOPTERA	CHIMARRA	aterrima	340	12.6	
TRICHOPTERA	DOLOPHILODES	sp	160	5.9	
TRICHOPTERA	RHYACOPHILA	minora	16	0.6	
PLECOPTERA	AGNETINA	capitata	0	0.0	Northern Sone
PLECOPTERA	ISOGENOIDES	sp	4	0.1	
PLECOPTERA	ISOPERLA	sp	28	1.0	
GASTROPODA	FERRISSIA	rivularis	4	0.1	Creeping ancylid
TRICLADIDA	CURA	sp	8	0.3	
OLIGOCHAETA	LUMBRICULIDAE	unid	8	0.3	
OLIGOCHAETA	LUMBRICINA	unid	24	0.9	

Batten Kill mi 36.5 Station 2

Order	Genera	Species	Density	PercentComp	CommonName
COLEOPTERA	OPTIOSERVUS	sp	324	10.1	
COLEOPTERA	OPTIOSERVUS	trivittatus	24	0.7	
COLEOPTERA	OPTIOSERVUS	ovalis	12	0.4	
COLEOPTERA	PROMORESIA	elegans	4	0.1	
COLEOPTERA	PROMORESIA	tardella	20	0.6	
DIPTERA	BEZZIA	group	4	0.1	
DIPTERA	CORYNONEURA	sp	4	0.1	
DIPTERA	CRICOTOPUS	spa	20	0.6	
DIPTERA	CRICOTOPUS	trifascia	24	0.7	
DIPTERA	EUKIEFFERIELLA	devonica	4	0.1	
DIPTERA	MICROTENDIPES	sp	8	0.2	
DIPTERA	PARAMETRIOCNEMUS	sp	36	1.1	
DIPTERA	POLYPEDILUM	aviceps	20	0.6	
DIPTERA	POTTHASTIA	gaedii	12	0.4	
DIPTERA	RHEOTANYTARSUS	sp	20	0.6	
DIPTERA	SYNORTHOCLADIUS	sp	4	0.1	
DIPTERA	THIENEMANNEMYIA	group	60	1.9	
DIPTERA	TVETENIA	discoloripes	20	0.6	
DIPTERA	TVETENIA	bavarica	44	1.4	
DIPTERA	LOPESCLADIUS	sp	12	0.4	
DIPTERA	EMPIDIDAE	unid	12	0.4	Aquatic Dance Fly
DIPTERA	SIMULIUM	tubersom	12	0.4	
DIPTERA	ANTOCHA	sp	8	0.2	
DIPTERA	HEXATOMA	sp	20	0.6	
EPHEMEROPTERA	BAETIDAE	imm	108	3.4	Small Minnow Mayfly
EPHEMEROPTERA	BAETIS	flavistriga	4	0.1	
EPHEMEROPTERA	ACENTRELLA	sp	296	9.2	
EPHEMEROPTERA	ACENTRELLA	turbida	212	6.6	
EPHEMEROPTERA	EPHEMERELLIDAE	imm	276	8.6	
EPHEMEROPTERA	EPHEMERELLA	subvaria	112	3.5	
EPHEMEROPTERA	HEPTAGENIIDAE	imm	28	0.9	
EPHEMEROPTERA	EPEORUS	sp	4	0.1	
EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	148	4.6	
EPHEMEROPTERA	ISONYCHIA	sp	12	0.4	
TRICHOPTERA	MICRASEMA	rusticum	20	0.6	
TRICHOPTERA	GLOSSOSOMA	sp	12	0.4	
TRICHOPTERA	HELICOPSYCHE	borealis	24	0.7	
TRICHOPTERA	CHEUMATOPSYCHE	sp	352	11.0	
TRICHOPTERA	SYMPHITOPSYCHE	bronta	140	4.4	
TRICHOPTERA	SYMPHITOPSYCHE	morosa	268	8.4	
TRICHOPTERA	SYMPHITOPSYCHE	slossonae	48	1.5	
TRICHOPTERA	SYMPHITOPSYCHE	sparna	72	2.2	
TRICHOPTERA	HYDROPTILA	sp	0	0.0	
TRICHOPTERA	LEPIDOSTOMA	sp	36	1.1	Little Plain Brown Sedge
TRICHOPTERA	SETODES	sp	20	0.6	
TRICHOPTERA	APATANIA	sp	8	0.2	Early Smoky Wing Sedge
TRICHOPTERA	CHIMARRA	socia	48	1.5	
TRICHOPTERA	DOLOPHILODES	sp	84	2.6	
TRICHOPTERA	RHYACOPHILA	melita	12	0.4	
TRICHOPTERA	RHYACOPHILA	minora	76	2.4	
PLECOPTERA	CHLOROPERLIDAE	unid	0	0.0	
PLECOPTERA	PARAGNETINA	immarginata	0	0.0	Beautiful Stone
PLECOPTERA	ISOPERLA	sp	8	0.2	
MEGALOPTERA	NIGRONIA	sp	4	0.1	
GASTROPODA	FERRISSIA	rivularis	4	0.1	Creeping ancylid
OLIGOCHAETA	LUMBRICULIDAE	unid	12	0.4	
OLIGOCHAETA	ENCHYTRAEIDAE	unid	4	0.1	Potworm
HYDRACHNIDIA	HYGROBATES	sp	4	0.1	
HYDRACHNIDIA	LEBERTIA	sp	4	0.1	
HYDRACHNIDIA	SPERCHON	sp	16	0.5	

Batten Kill mi 47.7, Station 3

Order	Genera	Species	Density	PercentComp	CommonName
COLEOPTERA	OPTIOSERVUS	sp	572	10.9	
COLEOPTERA	OPTIOSERVUS	trivittatus	16	0.3	
COLEOPTERA	OPTIOSERVUS	ovalis	16	0.3	
COLEOPTERA	OULIMNIUS	latiusculus	4	0.1	
COLEOPTERA	PROMORESIA	elegans	12	0.2	
COLEOPTERA	PROMORESIA	tardella	24	0.5	
COLEOPTERA	PSEPHENUS	herricki	20	0.4	
DIPTERA	ATHERIX	sp	16	0.3	
DIPTERA	BRILLIA	sp	4	0.1	
DIPTERA	CORYNONEURA	sp	4	0.1	
DIPTERA	CRICOTOPUS	spa	20	0.4	
DIPTERA	CRICOTOPUS	bisinctus	48	0.9	
DIPTERA	CRICOTOPUS	trifascia	220	4.2	
DIPTERA	EUKIEFFERIELLA	devonica	24	0.5	
DIPTERA	EUKIEFFERIELLA	pseudomontana	4	0.1	
DIPTERA	PARAMETRIOCNEMUS	sp	44	0.8	
DIPTERA	POLYPEDILUM	illionoense	4	0.1	
DIPTERA	POLYPEDILUM	aviceps	8	0.2	
DIPTERA	POTTHASTIA	gaedii	16	0.3	
DIPTERA	RHEOCRICOTOPUS	sp	4	0.1	
DIPTERA	SUBLETTEA	sp	16	0.3	
DIPTERA	THIENEMANNIELLA	sp	12	0.2	
DIPTERA	THIENEMANNEMYIA	group	36	0.7	
DIPTERA	TVETENIA	discoloripes	20	0.4	
DIPTERA	TVETENIA	bavarica	56	1.1	
DIPTERA	CRICOTOPUS/ORTHOCLAD	sp	56	1.1	
DIPTERA	MICROPSECTRA	sp	16	0.3	
DIPTERA	EMPIDIDAE	unid	36	0.7	Aquatic Dance Fly
DIPTERA	SIMULIUM	tubersom	4	0.1	
DIPTERA	ANTOCHA	sp	240	4.6	
DIPTERA	HEXATOMA	sp	12	0.2	
EPHEMEROPTERA	BAETIDAE	imm	16	0.3	Small Minnow Mayfly
EPHEMEROPTERA	BAETIS	sp	4	0.1	
EPHEMEROPTERA	ACENTRELLA	sp	120	2.3	
EPHEMEROPTERA	ACENTRELLA	turbida	52	1.0	
EPHEMEROPTERA	EPHEMERELLIDAE	imm	40	0.8	
EPHEMEROPTERA	EPHEMERELLA	subvaria	944	18.0	
EPHEMEROPTERA	STENONEMA	sp	12	0.2	
EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	68	1.3	
EPHEMEROPTERA	ISONYCHIA	sp	28	0.5	
TRICHOPTERA	BRACHYCENTRUS	americanus	20	0.4	
TRICHOPTERA	BRACHYCENTRUS	lateralis	8	0.2	
TRICHOPTERA	MICRASEMA	rusticum	28	0.5	
TRICHOPTERA	GLOSSOSOMA	sp	48	0.9	
TRICHOPTERA	HELICOPSYCHE	borealis	92	1.8	
TRICHOPTERA	HYDROPSYCHIDAE	unid	72	1.4	Netspinning Caddisfly
TRICHOPTERA	CHEUMATOPSYCHE	sp	456	8.7	
TRICHOPTERA	SYMPHITOPSYCHE	bronta	528	10.1	
TRICHOPTERA	SYMPHITOPSYCHE	morosa	228	4.4	
TRICHOPTERA	SYMPHITOPSYCHE	slossonae	136	2.6	
TRICHOPTERA	SYMPHITOPSYCHE	sparna	572	10.9	
TRICHOPTERA	LEPIDOSTOMA	sp	8	0.2	Little Plain Brown Sedge
TRICHOPTERA	SETODES	sp	4	0.1	
TRICHOPTERA	GOERA	sp	4	0.1	Little Grey Sedge
TRICHOPTERA	RHYACOPHILA	fuscula	4	0.1	
TRICHOPTERA	RHYACOPHILA	melita	4	0.1	
TRICHOPTERA	RHYACOPHILA	minora	48	0.9	
PLECOPTERA	CHLOROPERLIDAE	unid	4	0.1	
PLECOPTERA	ACRONEURIA	abnormis	0	0.0	Common Stone
PLECOPTERA	PARAGNETINA	media	32	0.6	Embossed Stone
PLECOPTERA	AGNETINA	capitata	12	0.2	Northern Sone
MEGALOPTERA	NIGRONIA	sp	4	0.1	
GASTROPODA	FERRISSIA	rivularis	16	0.3	Creeping ancylid
GASTROPODA	PHYSA	sp	4	0.1	Physa
GASTROPODA	PHYSA	integra	8	0.2	Ashy physa
OLIGOCHAETA	LUMBRICULIDAE	unid	16	0.3	
HYDRACHNIDIA	HYGROBATES	sp	4	0.1	
HYDRACHNIDIA	LEBERTIA	sp	4	0.1	

Batten Kill mi 50.1, Station 4

Order	Genera	Species	Density	PercentComp	CommonName
COLEOPTERA	HELICHUS	basilus	8	0.2	
COLEOPTERA	OPTIOSERVUS	sp	228	6.6	
COLEOPTERA	OPTIOSERVUS	trivittatus	20	0.6	
COLEOPTERA	OPTIOSERVUS	ovalis	16	0.5	
COLEOPTERA	OULIMNIUS	latiusculus	16	0.5	
COLEOPTERA	PROMORESIA	tardella	12	0.3	
COLEOPTERA	STENELMIS	sp	12	0.3	
COLEOPTERA	ANCHYTARSUS	bicolor	4	0.1	
DIPTERA	ATHERIX	sp	92	2.6	
DIPTERA	EUKIEFFERIELLA	devonica	4	0.1	
DIPTERA	MICROTENDIPES	sp	16	0.5	
DIPTERA	PARAMETRIOCNEMUS	sp	12	0.3	
DIPTERA	POLYPEDILUM	aviceps	12	0.3	
DIPTERA	RHEOTANYTARSUS	sp	12	0.3	
DIPTERA	THIENEMANNEMYIA	group	28	0.8	
DIPTERA	TVETENIA	bavarica	88	2.5	
DIPTERA	SIMULIUM	tubersom	48	1.4	
DIPTERA	SIMULIUM	vittatum	12	0.3	
DIPTERA	ANTOCHA	sp	4	0.1	
EPHEMEROPTERA	BAETIDAE	imm	12	0.3	Small Minnow Mayfly
EPHEMEROPTERA	BAETIS	intercalaris	4	0.1	
EPHEMEROPTERA	BAETIS	tricaudatus	16	0.5	
EPHEMEROPTERA	ACENTRELLA	sp	48	1.4	
EPHEMEROPTERA	ACENTRELLA	turbida	32	0.9	
EPHEMEROPTERA	EPHEMERELLIDAE	imm	0	0.0	
EPHEMEROPTERA	EPHEMERELLA	subvaria	132	3.8	
EPHEMEROPTERA	SERRATELLA	sp	164	4.7	
EPHEMEROPTERA	HEPTAGENIIDAE	imm	132	3.8	
EPHEMEROPTERA	EPEORUS	sp	16	0.5	
EPHEMEROPTERA	STENONEMA	sp	468	13.5	
EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	248	7.1	
EPHEMEROPTERA	ISONYCHIA	sp	296	8.5	
TRICHOPTERA	BRACHYCENTRUS	lateralis	8	0.2	
TRICHOPTERA	MICRASEMA	sp	4	0.1	
TRICHOPTERA	HELICOPSYCHE	borealis	8	0.2	
TRICHOPTERA	CHEUMATOPSYCHE	sp	344	9.9	
TRICHOPTERA	SYMPHITOPSYCHE	bronta	32	0.9	
TRICHOPTERA	SYMPHITOPSYCHE	slossonae	136	3.9	
TRICHOPTERA	SYMPHITOPSYCHE	sparna	128	3.7	
TRICHOPTERA	OECETIS	sp	4	0.1	
TRICHOPTERA	CHIMARRA	aterrima	380	10.9	
TRICHOPTERA	DOLOPHILODES	sp	104	3.0	
TRICHOPTERA	RHYACOPHILA	fuscula	16	0.5	
TRICHOPTERA	RHYACOPHILA	minora	16	0.5	
PLECOPTERA	CHLOROPERLIDAE	unid	8	0.2	
PLECOPTERA	ACRONEURIA	abnormis	16	0.5	Common Stone
PLECOPTERA	PARAGNETINA	immarginata	4	0.1	Beautiful Stone
PLECOPTERA	AGNETINA	capitata	0	0.0	Northern Sone
PLECOPTERA	ISOPERLA	sp	4	0.1	
MEGALOPTERA	NIGRONIA	sp	8	0.2	
DECAPODA	ORONECTES	virilis	8	0.2	
GASTROPODA	FERRISSIA	rivularis	8	0.2	Creeping ancylid
OLIGOCHAETA	LUMBRICULIDAE	unid	24	0.7	

Batten Kill mi 55.5, Station 5

Order	Genera	Species	Density	PercentComp	CommonName
COLEOPTERA	HELICHUS	fastigiatus	4	0.1	
COLEOPTERA	OPTIOSERVUS	sp	76	2.6	
COLEOPTERA	OPTIOSERVUS	trivittatus	20	0.7	
COLEOPTERA	OPTIOSERVUS	ovalis	60	2.1	
COLEOPTERA	OULIMNIUS	latiusculus	56	1.9	
COLEOPTERA	PROMORESIA	elegans	4	0.1	
COLEOPTERA	PROMORESIA	tardella	16	0.6	
DIPTERA	BEZZIA	group	24	0.8	
DIPTERA	CORYNONEURA	sp	4	0.1	
DIPTERA	CRICOTOPUS	spa	32	1.1	
DIPTERA	CRICOTOPUS	bisinctus	100	3.5	
DIPTERA	CRICOTOPUS	tremulus	36	1.2	
DIPTERA	CRICOTOPUS	trifascia	20	0.7	
DIPTERA	EUKIEFFERIELLA	devonica	20	0.7	
DIPTERA	EUKIEFFERIELLA	claripennis	24	0.8	
DIPTERA	MICROTENDIPES	sp	12	0.4	
DIPTERA	PARAMETRIOCNEMUS	sp	88	3.0	
DIPTERA	POLYPEDILUM	aviceps	16	0.6	
DIPTERA	POTTHASTIA	gaedii	48	1.7	
DIPTERA	POTTHASTIA	longimana	4	0.1	
DIPTERA	RHEOTANYTARSUS	distinctissimus	20	0.7	
DIPTERA	SYNORTHOCLADIUS	sp	4	0.1	
DIPTERA	TANYTARSUS	sp	8	0.3	
DIPTERA	THIENEMANNEMYIA	group	20	0.7	
DIPTERA	TVETENIA	discoloripes	4	0.1	
DIPTERA	TVETENIA	bavarica	196	6.8	
DIPTERA	MICROPSECTRA	sp	12	0.4	
DIPTERA	EMPIDIDAE	unid	8	0.3	Aquatic Dance Fly
DIPTERA	SIMULIUM	tubersom	152	5.2	
DIPTERA	ANTOCHA	sp	44	1.5	
DIPTERA	DICRANOTA	sp	4	0.1	
DIPTERA	HEXATOMA	sp	12	0.4	
EPHEMEROPTERA	BAETIDAE	imm	24	0.8	Small Minnow Mayfly
EPHEMEROPTERA	BAETIS	tricaudatus	16	0.6	
EPHEMEROPTERA	BAETIS	sp a	4	0.1	
EPHEMEROPTERA	ACENTRELLA	sp	56	1.9	
EPHEMEROPTERA	ACENTRELLA	turbida	44	1.5	
EPHEMEROPTERA	EPHEMERELLIDAE	imm	268	9.3	
EPHEMEROPTERA	EPHEMERELLA	sp	32	1.1	
EPHEMEROPTERA	EPHEMERELLA	subvaria	52	1.8	
EPHEMEROPTERA	HEPTAGENIIDAE	imm	20	0.7	
EPHEMEROPTERA	EPEORUS	sp	0	0.0	
EPHEMEROPTERA	STENONEMA	sp	40	1.4	
EPHEMEROPTERA	STENONEMA	luteum	4	0.1	
EPHEMEROPTERA	PARALEPTOPHLEBIA	sp	228	7.9	
EPHEMEROPTERA	ISONYCHIA	sp	8	0.3	
TRICHOPTERA	BRACHYCENTRUS	americanus	60	2.1	
TRICHOPTERA	MICRASEMA	sp	8	0.3	
TRICHOPTERA	GLOSSOSOMA	sp	4	0.1	
TRICHOPTERA	CHEUMATOPSYCHE	sp	72	2.5	
TRICHOPTERA	SYMPHITOPSYCHE	bronta	44	1.5	
TRICHOPTERA	SYMPHITOPSYCHE	morosa	36	1.2	
TRICHOPTERA	SYMPHITOPSYCHE	slossonae	140	4.8	
TRICHOPTERA	SYMPHITOPSYCHE	sparna	216	7.5	
TRICHOPTERA	HYDROPTILA	sp	4	0.1	
TRICHOPTERA	LEPIDOSTOMA	sp	8	0.3	Little Plain Brown Sedge
TRICHOPTERA	DOLOPHILODES	sp	68	2.3	
TRICHOPTERA	RHYACOPHILA	fuscula	4	0.1	
TRICHOPTERA	RHYACOPHILA	minora	92	3.2	
TRICHOPTERA	RHYACOPHILA	acutiloba	8	0.3	
PLECOPTERA	CHLOROPERLIDAE	unid	80	2.8	
PLECOPTERA	LEUCTRIDAE	unid	12	0.4	Needlefly
PLECOPTERA	AGNETINA	capitata	8	0.3	Northern Sone
PLECOPTERA	ISOPERLA	sp	28	1.0	
PLECOPTERA	ISOPERLA	lata	8	0.3	Dark Stripetail
PLECOPTERA	MALIREKUS	sp	0	0.0	
PLECOPTERA	PTERONARCYS	sp	8	0.3	Giant Stoneflies
OLIGOCHAETA	LUMBRICULIDAE	unid	12	0.4	
OLIGOCHAETA	ENCHYTRAEIDAE	unid	12	0.4	Potworm
HYDRACHNIDIA	HYGROBATES	sp	12	0.4	
HYDRACHNIDIA	LEBERTIA	sp	4	0.1	
HYDRACHNIDIA	SPERCHON	sp	4	0.1	

Appendix B

Water Chemistry 2001 and 2002
All sites and all dates

	Lab ID	Sampler	Date	Time	Flow		Temp	Ca	Mg	K	Na	Cl	NO3	NH3	Tot N	TP	TDP	SO4	Alk	Cond	Turb	pH
			mmddyy	xxxx	cfs		C	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	mg/l	mg/l	umho/cm	ntu	su
Batt 1	52925	KC	41901	1555	948		6	22.1	6.16	0.595	3.72	6.37	0.39	<0.05	0.57	10	8	5.29	71.1	174		7.91
Batt 1	55672	KC	73001	1525	85		20	30.1	8.5	0.908	5.43	10.7	0.22	<0.05	0.33	9	3	5.06	113	260		8.38
Batt 1	58688	KC	91801	835	37		11.5	33.4	12.8	0.838	7.77	12.1	0.21	<0.05	0.32	10	4	5.76	129	290		8.13
Batt 1	59542	KC	120501	1010	115		6.5	22	7.13	0.739	4.84	7.4	0.28	<0.05	0.39	11	6	5.91	81	188		8.36
Batt 1	61722	KC	52202	1205	606		9.5	21.4	6.22	0.497	3.92	6.2	0.26	<0.05	0.34	11	4	6.42	70.5	166	2.40	7.98
Batt 1	64165	KC	72302	1500	95		20	26.8	8.20	0.823	4.66	7.7	0.28	<0.05	0.81	108	10	5.22	89.4	205	51.00	7.91
Batt 1	66613	KC	91802	1430	71		15.5	29.1	10.80	0.986	7.33	11.3	0.18	<0.05	0.33	12	7	6.50	110.0	254	0.67	8.26
Batt 1	67870	KC	112002	1510	463		3	21.2	6.80	0.730	5.75	8.9	0.26	<0.05	0.40	11	7	5.84	73.7	181	1.20	7.84
Batt 2	52926	KC	41901	1620	742		6	24.3	7.17	0.661	4.36	7.89	0.39	<0.05	0.58	14		5.19	81.2	194		7.97
Batt 2	56673	KC	73001	1500	66		19.8	34.1	11.5	0.802	7.44	12.8	0.23	<0.05	0.37	10	3	5.04	127	287		8.35
Batt 2	58689	KC	91801	915	29		12.5	35.1	14.3	0.946	9.01	14.3	0.17	<0.05	0.29	13	5	5.82	137	311		8.27
Batt 2	59543	KC	120501	950	90		6	22.9	7.9	0.833	5.34	8.4	0.29	<0.05	0.41	14	10	5.87	87.2	203		8.33
Batt 2	61723	KC	52202	1125	475		9.5	23.0	6.98	0.596	4.59	7.0	0.22	<0.05	0.34	13	5	5.13	78.9	184	2.30	7.94
Batt 2	64166	KC	72302	1430	74		20	33.2	11.30	0.863	6.76	11.3	0.27	<0.05	0.50	25	6	5.29	116.0	264	9.00	7.97
Batt 2	66614	KC	91802	1405	56		15.5	31.5	11.60	1.060	7.67	12.6	0.20	<0.05	0.36	16	15	6.50	117.0	272	0.96	8.24
Batt 2	67871	KC	112002	1450	363		2.5	22.1	7.50	0.838	6.59	10.5	0.25	<0.05	0.40	13	8	5.79	80.8	200	1.60	7.73
Batt 3	52927	KC	41901	1500	343		6	32.3	8.73	0.78	6.58	12.2	0.44	0.09	0.68	29	26	5.6	105	252		8.02
Batt 3	55674	KC	73001	1610	31		19.5	47.5	16.1	1.35	14.2	22.1	0.46	<0.05	0.62	106	86	6.12	168	400		8.26
Batt 3	58690	KC	91801	1025	13		13	52.3	18.6	1.86	18.2	29.7	0.75	<0.05	1.12	208	152	7.68	196	469		8.18
Batt 3	59544	KC	120501	925	41		6	33.4	10.7	1.27	10.1	17.8	0.35	0.21	1.02	197	175	6.98	126	307		8.37
Batt 3	61724	KC	52202	1000	219		8.5	30.5	8.72	0.595	5.95	9.2	0.24	<0.05	0.33	5	3	5.20	105.0	240	0.60	8.09
Batt 3	64167	KC	72302	1400	34		21	43.3	14.40	1.030	7.98	14.4	0.36	<0.05	0.87	90	9	5.26	135.0	310	39.00	8.01
Batt 3	66615	KC	91802	1250	26		15	43.3	15.20	1.350	11.50	22.1	0.44	<0.05	0.61	86	70	8.14	163.0	389	1.35	8.06
Batt 3	67873	KC	112002	1410	167		2.5	30.4	8.90	1.210	10.30	16.0	0.42	0.08	0.67	81	72	6.54	105.0	265	2.20	7.86
Batt 4	52928	KC	41901	1720	331		7	21.5	10.6	0.827	5.33	9.8	0.4	<0.05	0.5	7	10	5.64	84.1	206		7.88
Batt 4	56675	KC	73001	1700	30		nd	40.1	19.2	1.06	9.75	18.6	0.32	<0.05	0.43	9	3	5.53	168	382		8.14
Batt 4	58691	KC	91801	1055	13		13	46.1	22.3	1.22	11.1	20.3	0.41	<0.05	0.56	8	11	6.75	190	432		8.08
Batt 4	59545	KC	120501	900	40		6	25.4	11.7	0.982	5.8	9.9	0.3	<0.05	0.4	7	5	6.1	109	247		8.19
Batt 4	61725	KC	52202	930	212		8.5	21.9	11.00	0.744	5.79	9.4	0.19	<0.05	0.28	6	3	5.12	91.5	217	0.80	7.82
Batt 4	64168	KC	72302	1255	33		21	42.3	20.40	1.130	10.00	18.5	0.36	<0.05	0.48	10	5	5.98	169.0	378	2.50	7.94

	Lab ID	Sampler	Date	Time	Flow		Temp	Ca	Mg	K	Na	Cl	NO3	NH3	Tot N	TP	TDP	SO4	Alk	Cond	Turb	pH
			mmddyy	xxxx	cfs		C	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	mg/l	mg/l	umho/cm	ntu	su
Batt 4	66616	KC	91802	1520	25		15.5	38.5	18.40	1.410	10.10	18.0	0.34	<0.05	0.52	10	4	8.18	161.0	370	1.35	7.88
Batt 4	67874	KC	112002	1340	162		2	22.0	10.80	0.920	5.96	9.9	0.26	<0.05	0.37	6	4	6.06	91.9	219	1.30	7.68
Batt 5	52929	KC	41901	1700	51		5	7.69	3.62	0.636	2.18	3.64	0.36	<0.05	0.5	11	3	4.46	29.2	80.6		7.56
Batt 5	56688	KC	73001	1716	5		nd	20.5	9.74	0.778	3.87	4.7	0.12	<0.05	0.19	5	3	4.1	90.6	198		7.87
Batt 5	58692	KC	91801	1117	2		12	22.7	11.2	0.752	2.44	2.7	0.1	<0.05	0.13	3	5	4.53	105	226		7.79
Batt 5	59547	KC	120501	837	6		6	4.96	4.44	0.679	1.52	2	0.12	<0.05	0.27	4	4	5.23	42	95.7		8.02
Batt 5	61726	KC	52202	900	33		6.5	6.5	2.80	0.566	1.60	1.7	0.10	<0.05	0.20	3	4	4.39	24.9	64.3	0.70	7.41
Batt 5	64169	KC	72302	1230	5		17	23.6	11.00	0.770	3.19	4.0	0.12	<0.05	0.20	8	5	4.52	96.2	202.0	0.72	7.71
Batt 5	66617	KC	91802	1540	4		15	21.1	9.40	0.891	4.52	6.0	0.23	<0.05	0.30	5	3	4.82	89.1	200.0	0.21	7.71
Batt 5	67875	KC	112002	1315	25		3	8.2	3.66	0.654	2.18	2.6	0.11	<0.05	0.22	4	3	4.94	32.4	830.0	0.50	7.44
Dog 1	52936	KC	42001	1145	653		3.5	12.3	1.77	0.502	7.59	13	0.36	<0.05	0.54	20	11	6.86	28.4	118		7.51
Dog 1	56683	SC	73101	1415	13		nd	20.1	3.06	0.985	17	28	0.44	<0.05	0.64	18	7	11.9	48.4	221		7.76
Dog 1	58683	SC	91901	1350	7		17	18.8	3.55	1.14	2.4	36.5	0.52	<0.05	0.7	16	6	14.6	48.6	255		7.65
Dog 1	59554	SC	120601	1155	32		8	17.5	2.67	0.899	15.3	23.9	0.65	<0.05	0.8	20	13	13.7	43.2	194		7.91
Dog 1	61733	KC	52302	1230	195		11.1	13.6	1.94	0.404	8.78	13.2	0.26	<0.05	0.32	9	6	8.29	34.4	132	0.80	7.74
Dog 1	64176	KC	72402	1130	54		18	21.8	2.87	0.721	14.40	22.9	0.34	<0.05	0.45	13	8	10.00	53.0	204	0.90	7.76
Dog 1	66625	KC	91902	1105	16		14	21.4	2.79	1.100	19.10	30.8	0.62	0.05	0.79	21	18	11.30	50.0	228	0.70	7.61
Dog 1	67882	KC	112102	1155	124		1.5	6.3	1.50	0.384	3.93	5.7	0.16	<0.05	0.25	5	3	5.82	15.9	69	1.40	7.19
Dog 2	52937	KC	42001	1115	590		3	12.2	1.71	0.466	7.25	12.3	0.36	<0.05	0.48	15	8	6.52	29.1	116		7.62
Dog 2	56684	SC	73101	1340	12		20	18.8	2.84	0.982	16.5	25.5	0.64	<0.05	0.88	56	32	9.83	47.7	207		8.73
Dog 2	58684	SC	91901	1405	6		15.5	19	3.05	1.16	19.5	30.7	0.71	<0.05	0.91	17	12	11.7	46.1	227		7.62
Dog 2	59555	SC	120601	1135	29		8	16.7	2.47	0.901	13.8	21.2	0.66	<0.05	0.83	29	21	12	41.2	180		7.81
Dog 2	61734	KC	52302	1210	176		10	13.8	1.70	0.395	8.81	12.1	0.21	<0.05	0.29	10	7	7.67	33.9	127	1.10	7.63
Dog 2	64177	KC	72402	1105	49		17	21.6	2.63	0.634	12.80	20.3	0.30	<0.05	0.40	18	13	9.13	53.8	193	0.95	8.03
Dog 2	66626	KC	91902	1045	14		12.5	20.6	2.84	1.080	17.80	29.1	0.65	0.05	0.87	46	41	10.40	52.2	224	0.74	7.63
Dog 2	67883	KC	112102	1140	112		1	14.0	2.11	0.591	10.30	16.2	0.24	0.12	0.74	29	24	8.79	37.6	148	1.60	7.60
Dog 3	56685	SC	73101	1100	11		19	18.6	2.76	1.14	15.7	25.5	0.88	<0.05	1.14	89	62	10.3	47.7	212		8.15
Dog 3	58685	SC	91901	1305	6		17	19.2	3.15	1.26	20.6	32.7	0.97	<0.05	1.23	66	39	11.9	45.4	236		9.06
Dog 3	59557	SC	120601	1125	27		8	16.6	2.45	0.897	14.6	22.4	0.66	0.09	0.92	47	36	12.2	41.4	184		7.98
Dog 3	61757	KC	52302	1148	168		10	14.1	1.89	0.400	8.16	12.5	0.22	<0.05	0.30	13	7	7.58	34.5	128	1.30	7.63
Dog 3	64178	KC	72402	1050	46		17	21.8	2.59	0.625	12.80	20	0.31	<0.05	0.41	19	15	9.01	54.4	193	0.57	7.97
Dog 3	66627	KC	91902	1030	14		13	21.7	2.85	1.220	19.30	29.2	0.72	0.07	1.03	76	80	10.5	53.8	116	0.92	8.11
Dog 3	67884	KC	112102	1120	106		1	13.6	1.92	0.567	9.07	13.9	0.28	<0.05	0.45	16	12	8.23	32.8	130	1.50	7.74
Dog 4	56687	SC	73101	1030	9		nd	20.3	2.88	1.49	20.6	28.6	1.06	0.52	1.95	198	191	15.5	51.8	242		7.76
Dog 4	58687	SC	91901	1245	4		16	21.2	3.5	3.03	32.9	44	1.04	1.69	3.48	542	474	21.8	59.3	326		7.58

	Lab ID	Sampler	Date	Time	Flow		Temp	Ca	Mg	K	Na	Cl	NO3	NH3	Tot N	TP	TDP	SO4	Alk	Cond	Turb	pH
			mmddyy	xxxx	cfs		C	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	mg/l	mg/l	umho/cm	ntu	su
Dog 4	59556	SC	120601	1105	21		8	18.2	2.5	1.11	16.9	26	0.42	0.46	1.09	108	86	12.9	47.6	206		7.94
Dog 4	61736	KC	52302	1130	130		9.4	15.0	1.96	0.377	9.08	13.6	0.21	0.06	0.33	20	15	7.80	37.4	138	0.90	7.63
Dog 4	64179	KC	72402	1030	36		16	24.0	2.70	0.658	13.60	21.1	0.32	0.07	0.49	44	36	9.16	59.4	206	0.80	7.82
Dog 4	66628	KC	91902	1012	11		12	22.2	3.03	1.630	22.60	35.4	0.39	0.91	1.82	257	201	10.90	62.1	264	1.28	7.49
Dog 4	67885	KC	112102	1100	82		1	12.7	1.90	0.580	8.68	14	0.28	<0.05	0.40	17	11	8.24	31.9	129	1.00	7.78
Dog 5	52940	KC	42001	1005	95		2.5	5.28	1.29	0.347	nd	4.67	0.27	<0.05	0.44	14	5	4.32	11.9	52.3		7.2
Dog 5	56686	SC	73101	915	1.9		14	9.74	1.82	0.458	6.94	10.4	0.21	<0.05	0.28	3	3	5.95	27.2	105		7.6
Dog 5	58686	SC	91901	1210	0.9		12	9.28	1.72	0.462	7.7	12.3	0.23	<0.05	0.28	3	3	6.53	23.8	106		7.6
Dog 5	59558	SC	120601	1145	4.6		6.5	8.85	1.75	0.493	5.14	7.5	0.25	<0.05	0.48	4	6	8.36	26	90.1		7.78
Dog 5	61737	KC	52302	1107	28		10	5.97	1.28	0.252	3.54	4.6	<0.10	<0.05	0.14	3	3	4.94	20.2	59.3	0.60	7.87
Dog 5	64180	KC	72402	1000	7.8		19	10.50	1.81	0.427	6.26	9.3	0.18	<0.05	0.24	5	4	5.40	27.7	98.4	0.63	7.57
Dog 5	66629	KC	91902	935	2.3		9	11.00	1.98	0.549	8.90	13.4	0.23	<0.05	0.28	7	3	7.13	27.3	0.0	0.21	7.59
Dog 5	67886	KC	112102	1040	18		1	13.50	2.07	0.628	10.60	16.8	0.30	<0.05	0.42	12	7	9.13	33.1	143.0	1.80	7.87
Castle 1	52930	KC	41901	1115	440		5	16.7	3.09	0.609	5.72	10	0.09	<0.05	0.31	12	3	7.59	46.8	141		7.71
Castle 1	56677	KC	73001	945	24		18	32.1	6.35	1.02	15.9	29.7	0.37	0.12	0.78	14	6	10.4	101	308		7.94
Castle 1	58696	RJ	91801	1420	7		15	38.5	8.25	1.62	24.7	38.1	0.41	<0.05	0.59	16	9	13.3	118	381		8.04
Castle 1	59548	KC	120501	1325	29		8	40.3	8.4	1.6	22.6	35.2	0.51	0.09	0.76	11	7	14.3	121	373		7.72
Castle 1	61727	KC	52202	1615	414		13	24.1	5.02	0.741	11.80	18.4	0.16	0.11	0.39	13	6	10.00	73.6	225	1.70	7.85
Castle 1	64170	KC	72302	930	34		21	35.7	7.36	1.390	20.40	32.6	0.63	0.09	0.91	16	10	12.50	99.5	328	0.84	7.63
Castle 1	66618	KC	91802	925	22		13.5	38.2	7.50	2.120	26.40	42.9	0.88	0.06	1.11	22	10	17.20	110.0	380	0.95	7.57
Castle 1	67876	KC	112002	945	252		4	18.9	3.50	0.635	8.70	13.4	<0.10	<0.05	0.24	13	6	8.40	54.5	168	1.00	7.61
Castle 2	52931	KC	41901	1010	223		5.5	19.8	3.86	0.666	6.93	12.1	0.08	<0.05	0.26	19	20	8.7	53.3	164		7.63
Castle 2	56678	KC	73001	845	12		13	33.4	6.85	0.737	15	24.7	0.17	<0.05	<0.10	9	5	6.96	104	298		7.55
Castle 2	58697	RJ	91801	1520	3		10.5	30.7	7	0.899	14.4	20.9	0.3	<0.05	0.37	3	4	8.08	99	279		7.42
Castle 2	59549	KC	120501	1350	15		10	36.7	7.4	1.9	15.6	27.1	0.28	<0.05	0.35	5	4	9.59	112	318		7.7
Castle 2	61728	KC	52202	1715	210		14	24.6	4.66	0.506	10.30	16.5	<0.10	<0.05	0.21	9	5	8.68	72.4	212	1.70	7.66
Castle 2	64171	KC	72302	845	17		10	30.8	6.21	0.763	13.50	22.1	0.29	<0.05	0.31	<5	3	9.61	86.3	258	0.22	7.23
Castle 2	66619	KC	91802	848	11		7.5	31.8	5.90	0.843	15.30	25.3	0.25	<0.05	0.29	3	<5	8.79	95.7	280	0.16	7.24
Castle 2	67877	KC	112002	900	128		2	26.5	5.40	1.050	13.80	23.7	0.12	<0.05	0.31	12	5	15.30	69.8	245	2.30	7.31
Mett 1	52932	KC	41901	1345	736		5	21.2	3.57	0.822	2.73	4.81	0.74	<0.05	0.87	24	6	7.54	57	146		7.88
Mett 1	56679	KC	73001	1310	40		20.5	38.5	6	1.65	5.5	8.6	0.67	<0.05	0.27	9	8	9.59	110	259		8.51
Mett 1	58698	RJ	91801	1200	11		13	39.8	6.45	1.92	6.08	9.4	0.59	<0.05	0.72	6	3	10.5	115	274		8.33
Mett 1	59550	KC	120501	1130	49		8.5	37.4	6.22	1.29	4.71	7.4	0.57	<0.05	0.65	5	3	10.6	107	248		8.55
Mett 1	61729	KC	52202	1400	692		11.5	22.8	3.92	0.848	3.80	5.5	0.64	<0.05	0.71	8	4	8.24	65.0	164	1.60	7.93
Mett 1	64172	KC	72302	1120	56		23	39.9	6.14	1.680	5.69	9.1	0.89	<0.05	0.98	10	6	10.10	106.0	254	0.90	8.35

	Lab ID	Sampler	Date	Time	Flow		Temp	Ca	Mg	K	Na	Cl	NO3	NH3	Tot N	TP	TDP	SO4	Alk	Cond	Turb	pH
			mmddyy	xxxx	cfs		C	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	mg/l	mg/l	umho/cm	ntu	su
Mett 1	66620	KC	91802	1120	37		13.5	37.4	5.90	1.960	6.23	10.1	0.60	<0.05	0.74	7	4	11.90	114.0	272	0.43	8.20
Mett 1	67878	KC	112002	1150	421		3.5	27.3	4.45	1.310	4.55	7.9	0.94	<0.05	1.04	15	6	11.70	73.6	200	1.20	7.84
Mett 2	52933	KC	41901	1420	171		7	25	4.58	0.484	2.56	4.44	0.52	<0.05	0.62	14	12	6.96	69.7	169		7.93
Mett 2	56680	KC	73001	1345	9.4		18.5	42.1	6.75	0.844	4.31	7	0.42	<0.05	0.48	5	3	9.02	125	280		8.14
Mett 2	58699	RJ	91801	1230	2.7		13	44.3	7.85	1.07	5.11	8	0.43	<0.05	0.53	4	3	10	131	297		7.99
Mett 2	59551	KC	120501	1150	11		8	37.6	6.74	0.739	3.8	5.9	0.41	<0.05	0.5	6	5	9.52	113	250		8.35
Mett 2	61730	KC	52202	1325	161		10	25.8	4.66	0.467	3.15	4.5	0.35	<0.05	0.38	7	3	7.42	76.6	177	1.00	7.86
Mett 2	64173	KC	72302	1150	13		19	43.3	7.46	0.865	4.69	7.4	0.41	<0.05	0.46	6	5	9.53	121.0	272	0.28	8.02
Mett 2	66621	KC	91802	1200	8.6		12.5	42.9	7.10	1.070	5.33	8.7	0.37	<0.05	0.44	5	3	10.30	133.0	294	0.20	7.92
Mett 2	67879	KC	112002	1230	98		4.5	29.2	5.20	0.716	4.33	7.3	0.51	<0.05	0.59	6	3	9.34	85.3	209	0.90	7.74
Poult 1	52934	KC	41901	1300	191		5	16.1	2.6	0.602	3.35	5.45	0.47	<0.05	0.57	11	7	7.4	39.2	117		7.8
Poult 1	56681	KC	73001	1130	10		18.8	31.7	5.25	1.44	9.52	13.3	0.36	<.05	0.47	7	8	9.89	91.4	240		8.49
Poult 1	58693	RJ	91801	1336	3		14	32.4	5.9	1.68	11.1	16.3	0.3	<0.05	0.4	5	4	11.1	96	261		8.62
Poult 1	59552	KC	120501	1223	13		8	33.7	5.94	1.48	9.22	13.7	0.47	<0.05	0.56	4	3	13.2	97.2	257		8.68
Poult 1	61731	KC	52202	1445	179		13	18.5	2.9	0.672	4.46	5.9	0.21	<0.05	0.30	10	4	8.46	51.6	140	0.70	8.11
Poult 1	64174	KC	72302	1035	15		26	32.0	5.2	1.500	9.43	13.5	0.37	<0.05	0.46	11	8	10.80	89.8	238	0.40	8.44
Poult 1	66622	KC	91802	1006	10		12.5	33.3	5.3	1.915	10.95	16.0	0.37	<0.05	0.47	8	4	12.80	97.1	264	0.23	8.19
Poult 1	67880	KC	112002	1040	109		2	24.4	4.4	1.300	6.42	10.3	1.09	<0.05	1.26	11	7	17.80	60.9	197	1.70	7.81
Poult 2	52935	KC	41901	1230	171		5	15.3	2.51	0.601	3.25	5.39	0.48	<0.05	0.65	12	5	7.3	40.3	116		7.77
Poult 2	56682	KC	73001	1200	9		19.5	31.5	5.35	1.86	9.01	13.5	0.42	<0.05	0.81	60	39	9.92	92.8	246		8.14
Poult 2	58695	RJ	91801	1320	3		15	32.7	6.1	1.95	11.3	16.5	0.3	<0.05	0.51	27	16	11	95.6	260		8.59
Poult 2	59553	KC	120501	1245	11		8.5	33.7	6.18	1.6	9.21	13.6	0.47	<0.05	0.62	8	6	13	96.6	255		8.77
Poult 2	61732	KC	52202	1510	161		13	18.6	3.05	0.654	4.47	5.8	0.22	<0.05	0.30	9	5	8.55	52.1	140	1.00	7.90
Poult 2	64175	KC	72302	1015	13		27	31.3	5.34	1.600	9.75	13.5	0.30	<0.05	0.42	14	11	10.60	88.2	233	0.42	8.55
Poult 2	66623	KC	91802	1035	9		12	33.4	5.1	1.920	10.80	15.7	0.34	<0.05	0.48	13	7	12.80	96.8	259	0.25	8.17
Poult 2	67881	KC	112002	1100	98		2.5	25.4	4.3	1.290	6.14	9.9	1.12	<0.05	1.22	12	8	17.60	60.3	195	1.20	7.73

Appendix C

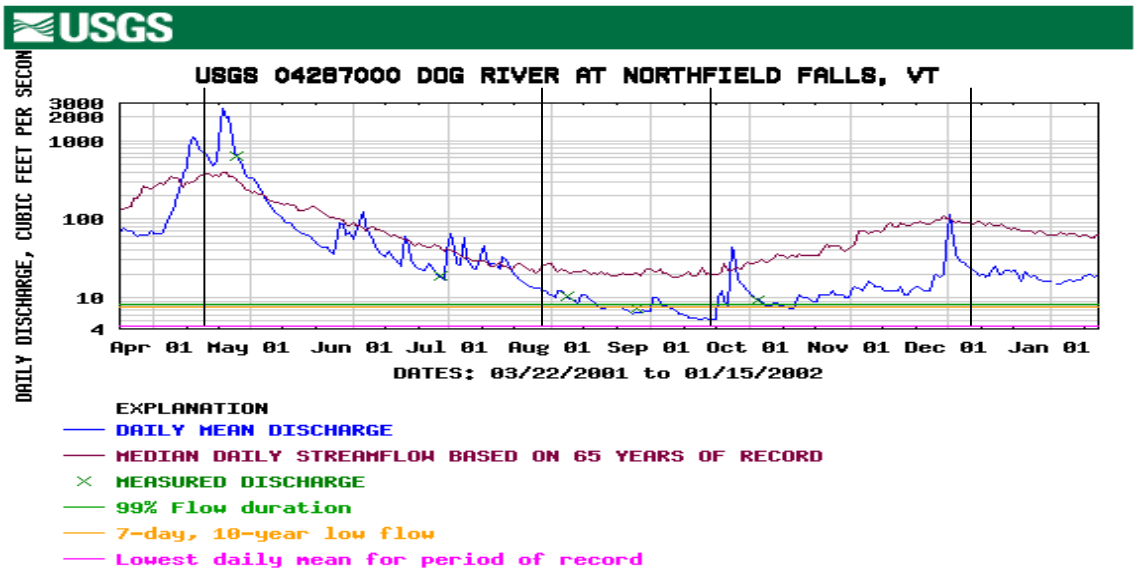
2002 Chemistry Descriptive Statistics

		All Sites	Batt 5	Batt 4	Batt 3	Batt 2	Batt 1	Dog 5	Dog 4	Dog 3	Dog 2	Dog 1	Cas 2	Cas 1	Mett 2	Mett 1	Poult 2	Poult 1
Temp	**mean**	11.2	10.4	11.8	11.8	10.0	12.0	9.8	9.6	10.2	10.1	11.2	8.7	12.9	11.5	12.9	13.6	13.2
	Std. Error	0.8	3.4	4.1	4.0	3.5	3.7	3.7	3.2	2.6	3.4	3.5	2.0	3.5	3.0	4.0	5.0	3.8
©	**median**	11.8	10.8	12.0	11.8	9.5	12.5	9.5	10.7	10.0	11.3	12.6	10.0	13.3	11.3	12.5	12.5	12.5
	max	27.0	17.0	21.0	21.0	20.0	20.0	19.0	16.0	17.0	17.0	18.0	14.0	21.0	19.0	23.0	27.0	26.0
	min	1.0	3.0	2.0	2.5	2.5	3.0	1.0	1.0	1.0	1.0	1.5	2.0	4.0	4.5	3.5	2.5	2.0
Calcium	**mean**	24.64	14.9	31.2	36.9	26.4	24.6	10.2	18.5	17.1	17.5	15.8	28.9	29.2	35.3	31.9	27.2	28.3
	Std. Error	1.17	4.4	5.4	3.7	2.5	2.0	1.6	2.7	1.9	2.1	3.7	1.4	4.6	4.6	4.1	3.3	2.9
(mg/l)	**median**	23.30	14.7	30.3	36.9	23.0	24.1	10.8	18.6	14.2	17.3	17.5	30.6	29.9	36.1	32.4	28.4	32.0
	max	43.30	23.6	42.3	43.3	33.2	29.1	13.5	24.0	21.8	21.6	21.8	31.8	38.2	43.3	39.9	33.4	33.4
	min	5.97	6.5	21.9	30.4	22.0	21.2	6.0	12.7	13.6	13.8	6.3	24.6	18.9	25.8	22.8	18.6	18.5
Magnesium	**mean**	5.81	6.72	15.15	11.81	8.97	8.01	1.79	2.40	2.23	2.32	2.28	5.68	5.85	6.11	5.10	4.45	4.59
	Std. Error	0.49	2.05	2.49	1.74	1.02	1.02	0.18	0.28	0.21	0.26	0.33	0.30	0.97	0.69	0.54	0.52	0.45
(mg/l)	**median**	5.14	6.53	14.70	11.65	7.80	7.50	1.90	2.33	1.92	2.37	2.37	5.90	6.19	6.15	5.18	4.70	5.18
	max	20.40	11.00	20.40	15.20	11.60	10.80	2.07	3.03	2.85	2.84	2.87	6.40	7.50	7.46	6.14	5.34	5.30
	min	1.28	2.80	10.80	8.72	6.98	6.22	1.28	1.90	1.88	1.70	1.50	4.66	3.50	4.66	3.92	3.05	2.92
Potassium	**mean**	0.921	0.720	1.051	1.046	0.839	0.759	0.464	0.811	0.642	0.675	0.652	0.785	1.222	0.780	1.450	1.366	1.460
	Std. Error	0.054	0.071	0.143	0.164	0.074	0.102	0.082	0.279	0.151	0.145	0.168	0.087	0.343	0.127	0.241	0.270	0.231
(mg/l)	**median**	0.797	0.712	1.025	1.120	0.841	0.777	0.488	0.619	0.567	0.613	0.563	0.771	1.066	0.791	1.495	1.445	1.500
	max	2.120	0.891	1.410	1.350	1.060	0.986	0.628	1.630	1.220	1.080	1.100	1.050	2.120	1.070	1.960	1.920	1.940
	min	0.252	0.566	0.744	0.595	0.596	0.497	0.252	0.377	0.398	0.395	0.384	0.506	0.635	0.467	0.848	0.654	0.672
Sodium	**mean**	9.04	2.87	7.96	8.93	6.44	5.42	7.33	13.49	11.50	12.43	11.55	13.28	16.83	4.38	5.07	7.79	8.44
	Std. Error	0.61	0.64	1.21	1.23	0.51	0.74	1.55	3.24	2.13	1.97	3.30	0.82	4.04	0.46	0.55	1.49	1.29
(mg/l)	**median**	8.45	2.69	7.98	9.14	6.76	5.21	7.58	11.34	9.07	11.55	11.59	13.50	16.10	4.51	5.12	7.95	9.43
	max	26.40	4.52	10.10	11.50	7.67	7.33	10.60	22.60	19.30	17.80	19.10	15.30	26.40	5.33	6.23	10.80	11.00
	min	1.60	1.60	5.79	5.95	4.59	3.92	3.54	8.68	8.09	8.81	3.93	10.30	8.70	3.15	3.80	4.47	4.46

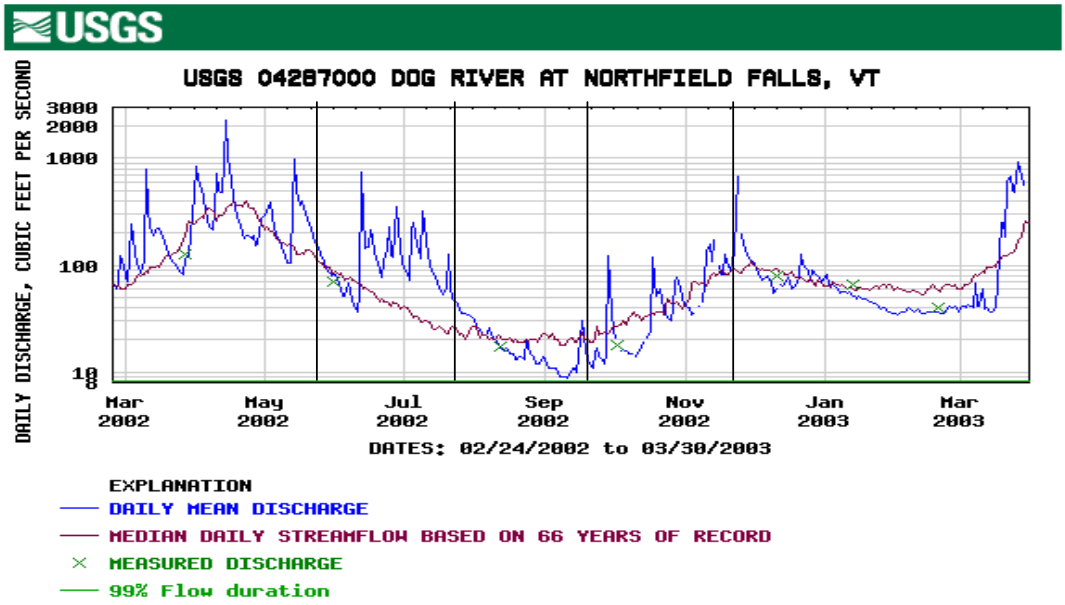
		All Sites	Batt 5	Batt 4	Batt 3	Batt 2	Batt 1	Dog 5	Dog 4	Dog 3	Dog 2	Dog 1	Cas 2	Cas 1	Mett 2	Mett 1	Poult 2	Poult 1
Chloride	**mean**	14.2	3.6	14.0	15.4	10.4	8.5	11.0	21.0	17.6	19.4	18.2	22.0	26.8	7.0	8.2	11.2	12.3
	Std. Error	1.0	0.9	2.5	2.7	0.9	1.1	2.6	5.1	3.2	3.6	5.5	1.5	6.7	0.9	1.0	2.2	1.9
(mg/l)	**median**	12.9	3.3	14.0	15.2	10.5	8.3	11.4	17.6	13.9	18.3	18.1	22.2	25.5	7.4	8.5	11.7	13.5
	max	42.9	6.0	18.5	22.1	12.6	11.3	16.8	35.4	29.2	29.1	30.8	25.3	42.9	8.7	10.1	15.7	16.0
	min	1.7	1.7	9.4	9.2	7.0	6.2	4.6	13.6	12.4	12.1	5.7	16.5	13.4	4.5	5.5	5.8	5.9
Nitrate	**mean**	0.36	0.14	0.29	0.37	0.24	0.25	N/A	0.30	0.35	0.35	0.35	N/A	N/A	0.41	0.77	0.50	0.48
	Std. Error	0.03	0.03	0.04	0.05	0.01	0.02	N/A	0.04	0.09	0.10	0.10	N/A	N/A	0.04	0.09	0.21	0.16
(mg/l N)	**median**	0.29	0.12	0.30	0.39	0.25	0.26	N/A	0.30	0.28	0.27	0.30	N/A	N/A	0.39	0.77	0.32	0.37
	max	1.12	0.23	0.36	0.44	0.27	0.28	N/A	0.39	0.72	0.65	0.62	N/A	N/A	0.51	0.94	1.12	1.09
	min	0.10	0.10	0.19	0.24	0.20	0.18	N/A	0.21	0.22	0.21	0.16	N/A	N/A	0.35	0.60	0.22	0.21
Ammonia	**mean**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Std. Error	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
(mg/l N)	**median**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	max	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	min	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Nitrogen	**mean**	0.51	0.23	0.41	0.62	0.40	0.47	0.27	0.76	0.50	0.58	0.45	0.29	0.66	0.47	0.87	0.61	0.59
	Std. Error	0.04	0.02	0.05	0.11	0.03	0.11	0.06	0.35	0.14	0.14	0.12	0.02	0.21	0.04	0.08	0.21	0.17
(mg/l N)	**median**	0.40	0.21	0.43	0.64	0.39	0.37	0.26	0.45	0.41	0.57	0.39	0.31	0.65	0.45	0.86	0.45	0.46
	max	1.82	0.30	0.52	0.87	0.50	0.81	0.42	1.82	1.03	0.87	0.79	0.31	1.11	0.59	1.04	1.22	1.26
	min	0.14	0.20	0.28	0.33	0.34	0.33	0.14	0.33	0.30	0.29	0.25	0.21	0.24	0.38	0.71	0.30	0.30
Total Phosphorus	**mean**	22	5	8	66	16	36	7	85	28	26	12	N/A	16	6	10	12	10
	Std. Error	5	1	1	20	2	24	2	58	12	8	3	N/A	2	0	2	1	1
(ug/l P)	**median**	12	5	8	84	13	12	6	32	16	24	11	N/A	15	6	9	13	10
	max	257	8	10	90	25	108	12	257	76	46	21	N/A	22	7	15	14	11
	min	3	3	6	5	13	11	3	17	13	10	5	N/A	13	5	7	9	7
Dissolved Phosphorus	**mean**	14	4	4	39	9	7	4	66	24	21	9	N/A	8	4	5	8	5
	Std. Error	3	0	0	19	2	1	1	45	14	7	3	N/A	1	1	1	1	1
(ug/l P)	**median**	6	4	4	40	8	7	4	26	12	19	7	N/A	8	3	5	8	4
	max	201	5	5	72	15	10	7	201	80	41	18	N/A	10	5	6	11	8
	min	3	3	3	3	5	4	3	11	7	7	3	N/A	6	3	4	5	4

		All Sites	Batt 5	Batt 4	Batt 3	Batt 2	Batt 1	Dog 5	Dog 4	Dog 3	Dog 2	Dog 1	Cas 2	Cas 1	Mett 2	Mett 1	Poult 2	Poult 1
Sulfate	**mean**	8.67	4.67	6.34	6.29	5.70	6.00	6.65	9.03	8.58	9.00	8.85	10.40	12.03	9.15	10.49	12.39	12.53
	Std. Error	0.37	0.13	0.65	0.69	0.24	0.30	0.95	0.69	0.55	0.56	1.18	1.24	1.92	0.61	0.85	1.94	1.54
(mg/l)	**median**	8.35	4.67	6.02	5.90	5.78	6.13	6.27	8.70	8.23	8.96	9.15	9.40	11.25	9.44	10.90	11.70	12.70
	max	17.80	4.94	8.18	8.14	6.50	6.50	9.13	10.90	10.50	10.40	11.30	15.30	17.20	10.30	11.90	17.60	17.80
	min	4.39	4.39	5.12	5.20	5.13	5.22	4.94	7.80	7.54	7.67	5.82	8.68	8.40	7.42	8.24	8.55	8.46
Alkalinity	**mean**	75.3	60.7	128.4	127.0	94.7	85.9	27.1	47.7	42.0	44.4	38.3	78.5	84.4	104.0	89.7	74.4	79.3
	Std. Error	4.3	18.6	21.2	13.9	8.9	9.0	2.6	7.6	5.0	5.0	8.5	5.3	12.6	13.6	12.0	10.8	9.6
(Mg/l as CaCO3)	**median**	73.6	60.8	126.5	120.0	80.9	81.6	27.5	48.4	34.5	44.9	42.2	72.4	86.6	103.2	89.8	74.3	89.8
	max	169.0	96.2	169.0	163.0	117.0	110.0	33.1	62.1	54.4	53.8	53.0	95.7	110.0	133.0	114.0	96.8	97.2
	min	15.9	24.9	91.5	105.0	78.9	70.5	20.2	31.9	32.8	33.9	15.9	68.5	54.5	76.6	65.0	52.1	51.6
Conductivity	**mean**	217.5	324	296	301	224	202	75	184	139	173	158	251	275	238	223	207	220
	Std. Error	13.0	172	45	33	18	19	30	32	14	22	36	11	48	27	25	26	23
(umhos/cm)	**median**	205.5	201	295	288	200	193	79	172	128	171	168	258	277	241	227	214	238
	max	830.0	830	378	389	272	254	143	264	193	224	228	280	380	294	272	259	264
	min	0.0	64	217	240	184	166	0	129	116	127	69	212	168	177	164	140	140
Turb	**mean**	2.42	0.53	1.49	10.79	3.09	13.82	0.81	1.00	1.10	1.10	0.95	0.92	1.12	0.60	1.03	0.72	0.65
	Std. Error	0.92	0.12	0.36	9.41	1.50	12.40	0.34	0.10	0.16	0.18	0.16	0.45	0.20	0.21	0.25	0.23	0.28
ntu	**median**	0.95	0.60	1.33	1.78	2.00	1.80	0.62	0.95	1.20	1.03	0.85	0.23	0.98	0.59	1.05	0.71	0.40
	max	51.00	0.72	2.50	39.00	9.00	51.00	1.80	1.28	1.50	1.60	1.40	2.30	1.70	1.00	1.60	1.20	1.70
	min	0.16	0.21	0.80	0.60	0.96	0.67	0.21	0.80	0.57	0.74	0.70	0.16	0.84	0.20	0.43	0.25	0.23
pH	**mean**	7.81	7.57	7.83	8.01	7.92	8.00	7.73	7.68	7.82	7.72	7.58	7.34	7.67	7.89	8.08	8.09	8.15
	Std. Error	0.03	0.08	0.06	0.05	0.09	0.09	0.08	0.08	0.09	0.10	0.13	0.08	0.06	0.06	0.12	0.18	0.10
(standard units)	**median**	7.82	7.58	7.85	8.04	7.94	7.95	7.73	7.71	7.74	7.63	7.68	7.26	7.62	7.89	8.07	8.04	8.17
	max	8.55	7.71	7.94	8.09	8.24	8.26	7.87	7.82	8.11	8.03	7.76	7.66	7.85	8.02	8.35	8.55	8.44
	min	7.19	7.41	7.68	7.86	7.73	7.84	7.57	7.49	7.63	7.60	7.19	7.21	7.57	7.74	7.84	7.73	7.81

Appendix D: Average Daily Discharge at four USGS gauging sites within the sampling area. Vertical bars represent days on which samples were collected.



Provisional Data Subject to Revision



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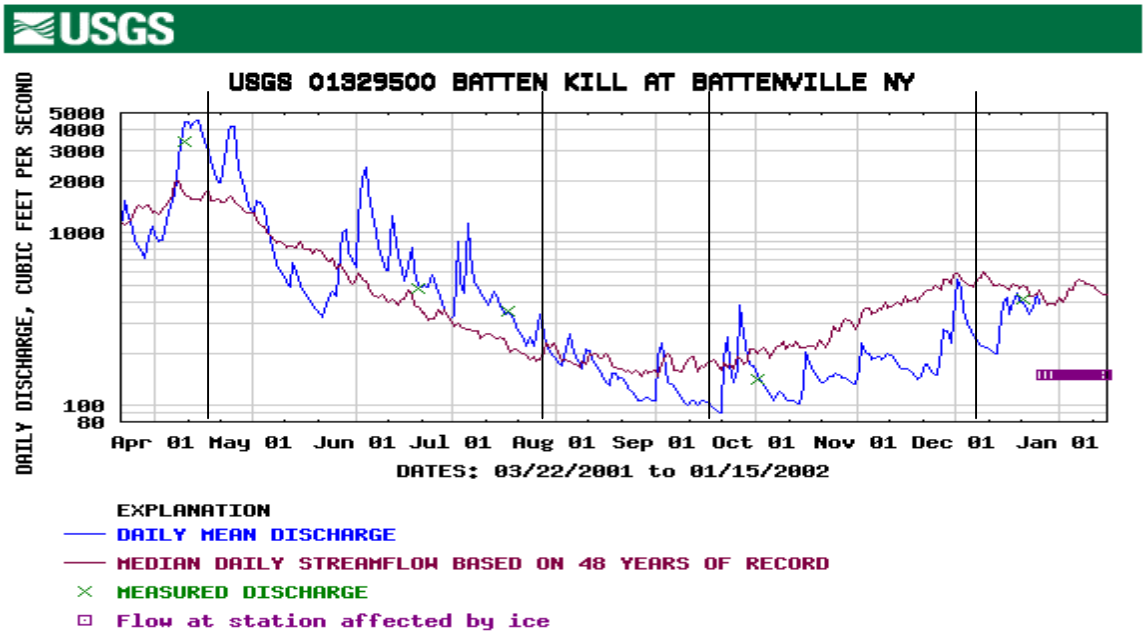

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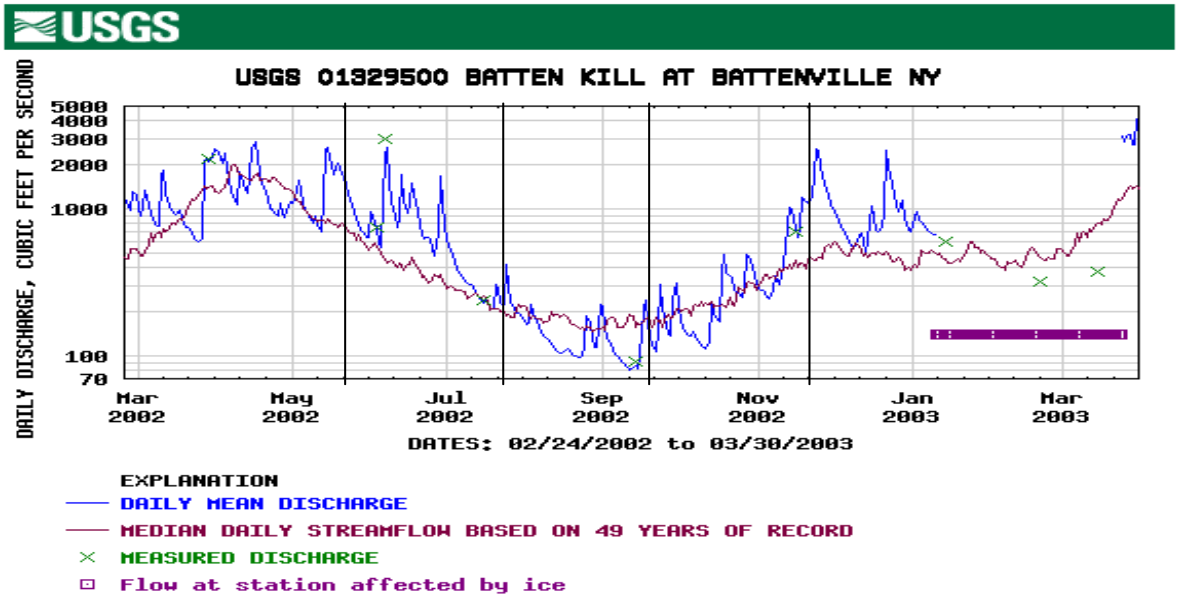

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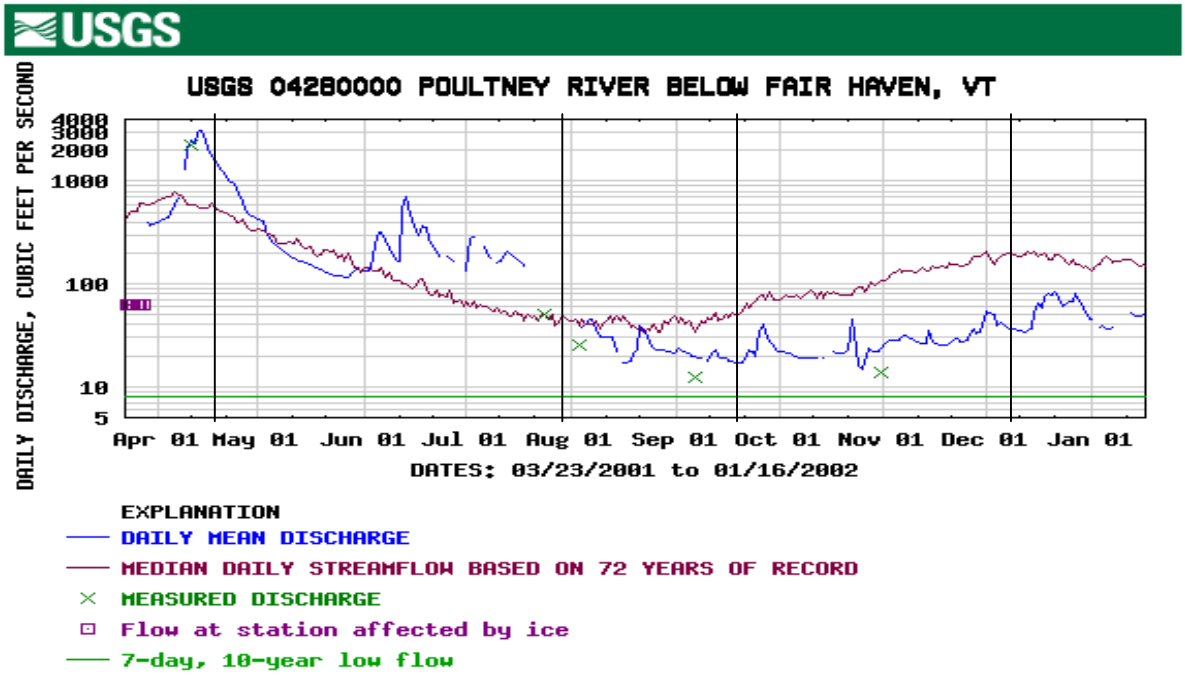

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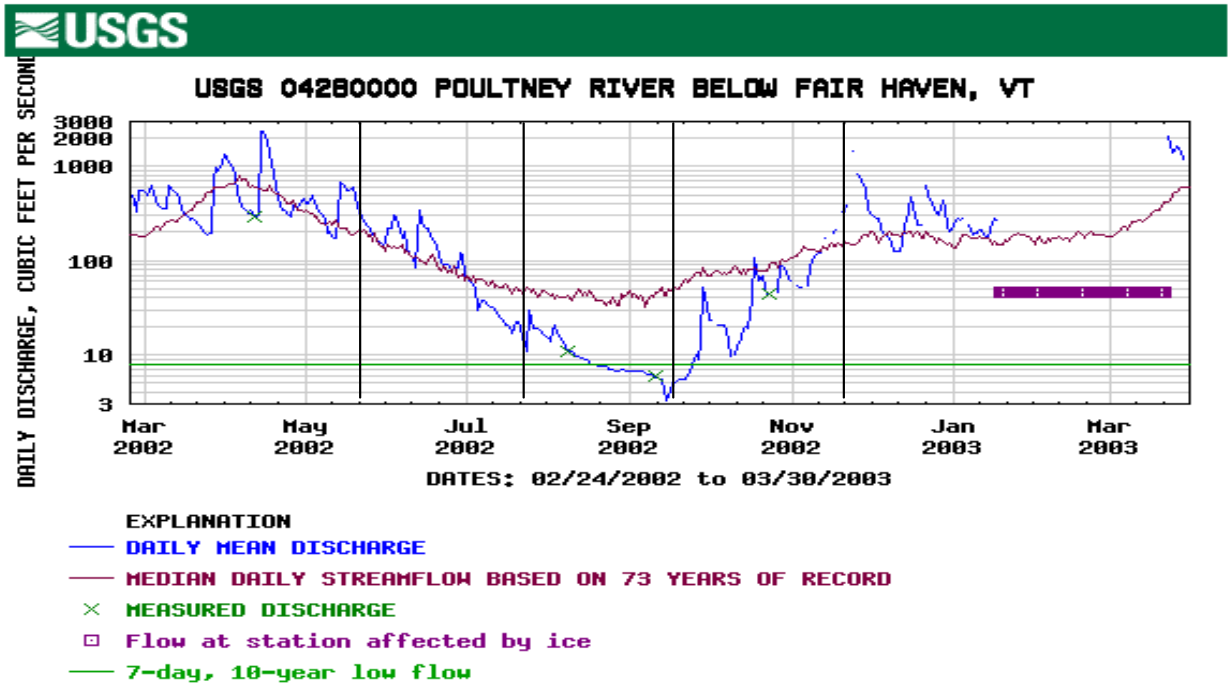

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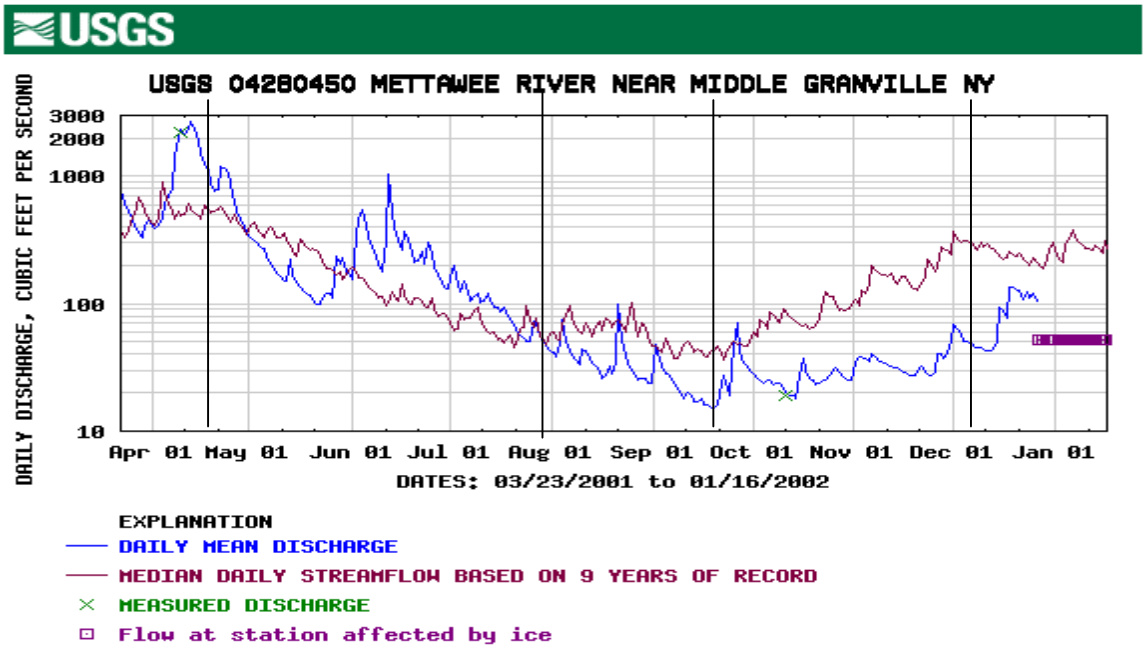

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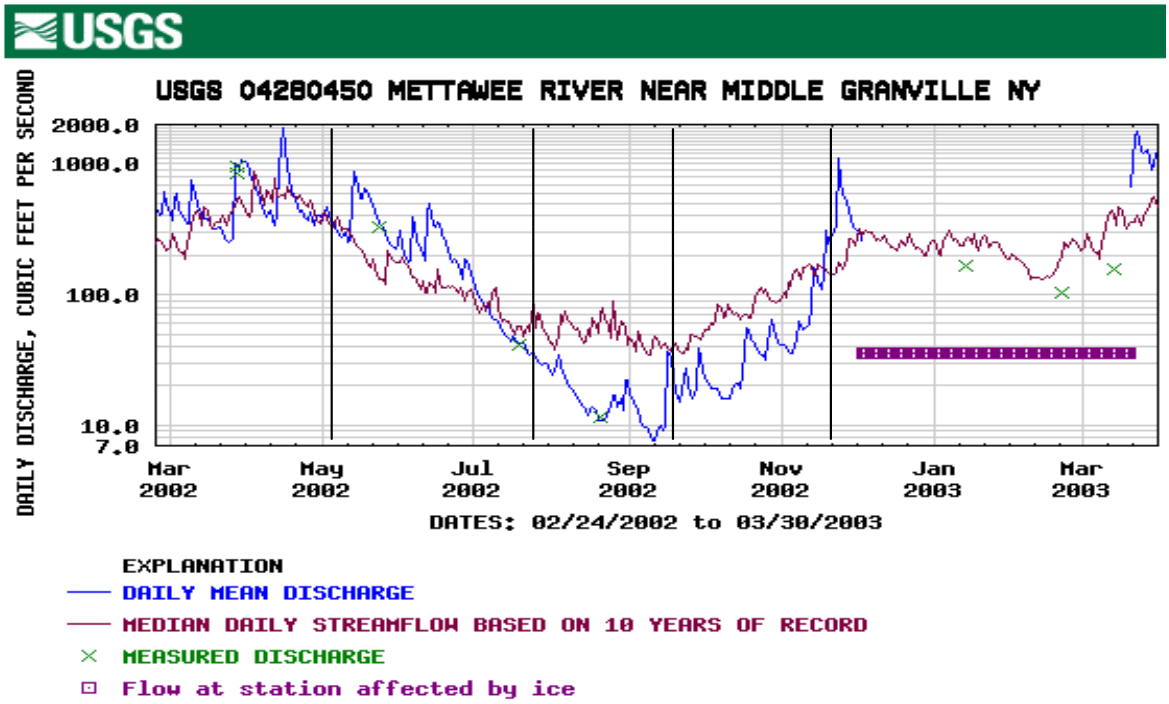

Provisional Data Subject to Revision

Appendix E: Batten Kill Study Sampling Station Pictures

Figure 1 Dog River 0.9 station 1

Figure 2 Dog River mi 5.7 Station 2

Figure 3 Dog River mi 7.0, Station 3

Figure 4 Dog River mi 8.6, Station 4

Figure 5 Dog River mi 14.8, Station 5

Figure 6 Poultney River mi 31.9, Station 1

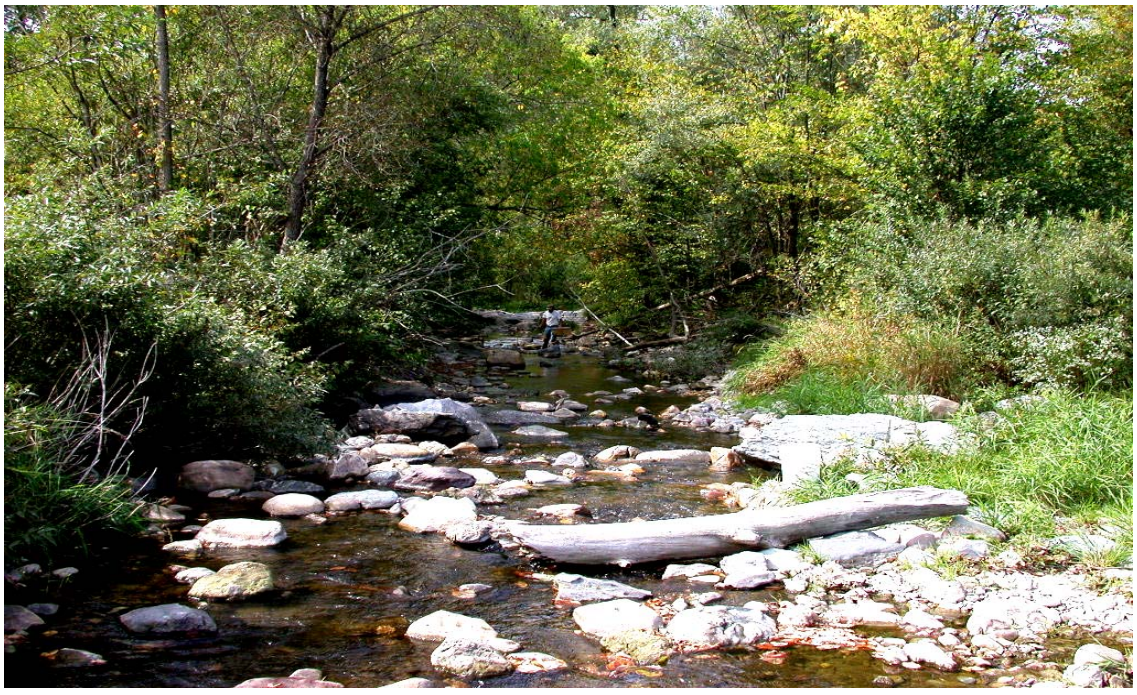

Figure 7 Poultney River mi 32.9, Station 2

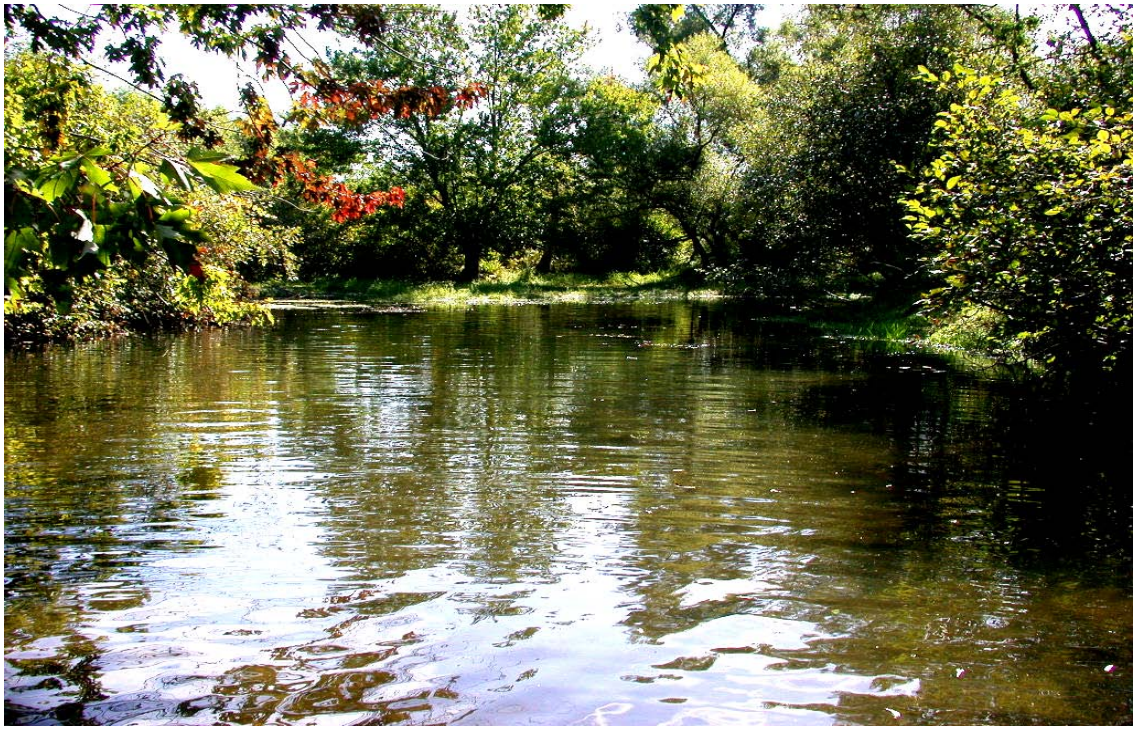

Figure 8 Castleton River mi 4.8, Station 1

Figure 9 Castleton River mi. 9.6, Station 2

Figure 10 Mettawee River mi 23.6, Station 1

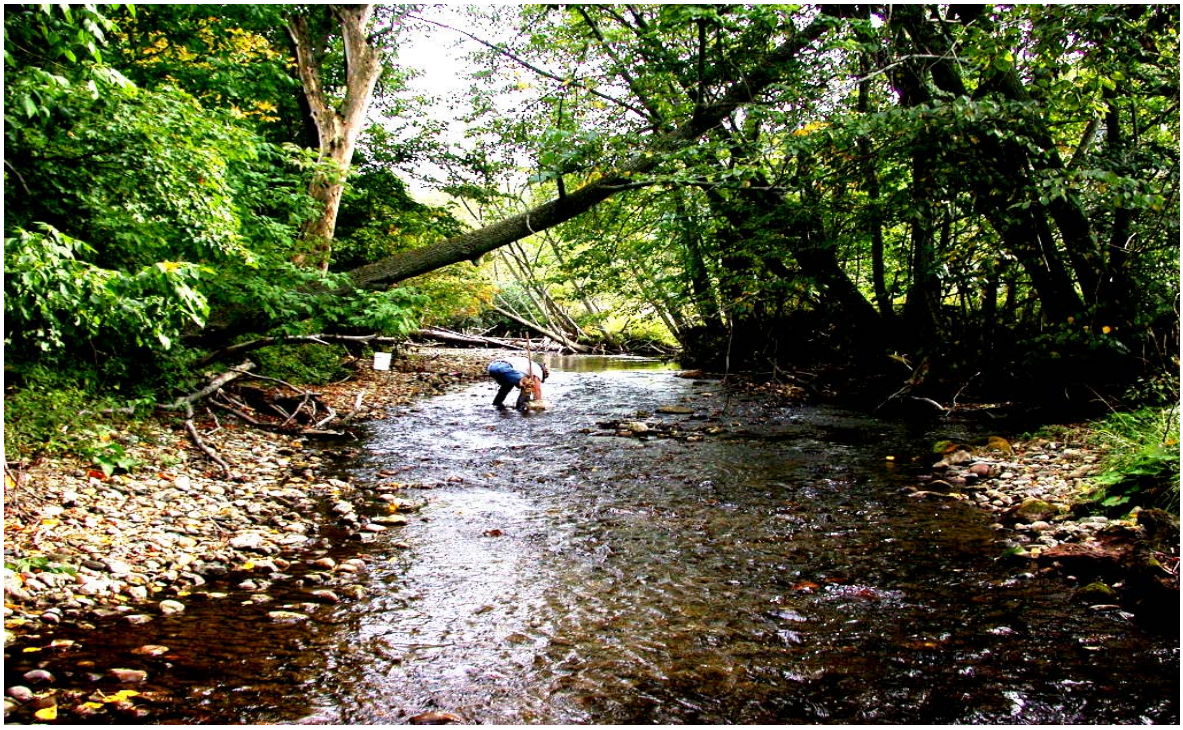

Figure 11 Mettawee River mi 32.5, Station 2

Figure 12 Batten Kill mi 32.9, Station 1

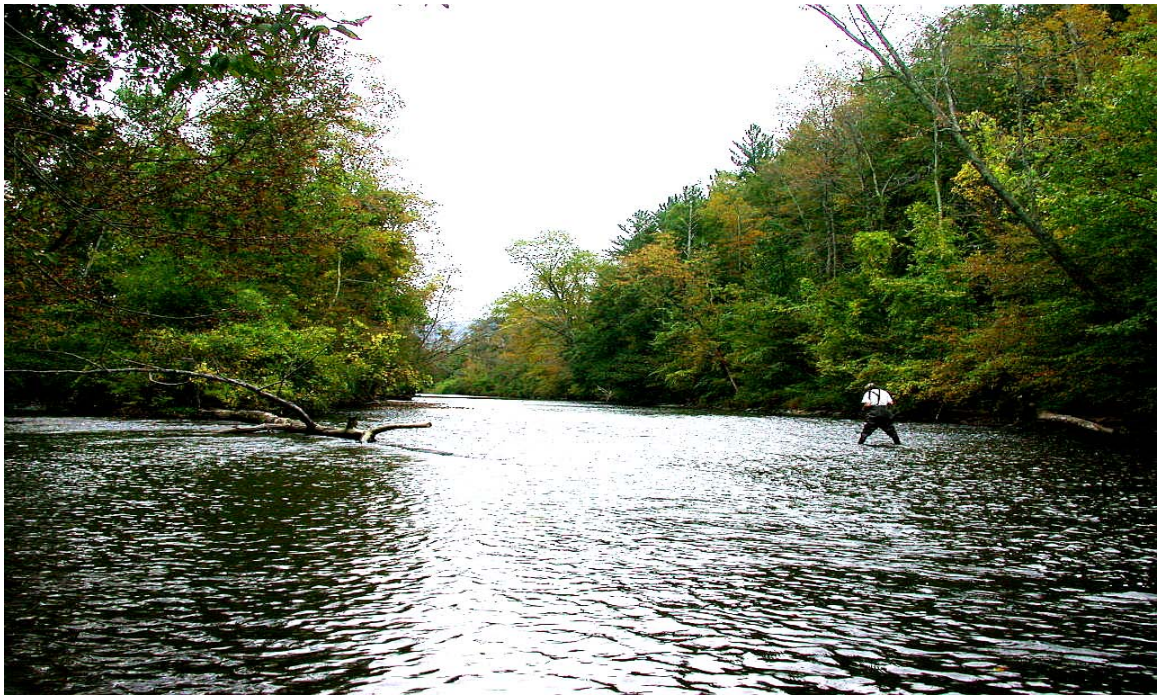

Figure 13 Batten Kill mi 36.5, Station 2

Figure 14 Batten Kill mi 47.7, Station 3

Figure 15 Batten Kill 47.7 Algae below WWTF

Figure 16 Batten Kill mi 50.1, Station 4

Figure 17 Batten Kill mi 55.5, Station 5