2012

Volunteer Biological
Stream Data Collection Report
For the Ossipee Watershed

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ACKNOWLEDGEMENTS

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1. INTRODUCTION

The New Hampshire Department of Environmental Services (DES) has conducted stream surveys to determine the health of aquatic communities since 1997. As part of these efforts DES developed a preliminary screening protocol for 1st through 4th order streams that is appropriate for volunteers and untrained professionals to evaluate the biological condition of aquatic macroinvertebrate communities. The goals are to supplement biological data collected by the DES, educate the public about water quality issues as interpreted through biological assessments, build a constituency of individuals to practice sound water quality management at the local level, and build public support for water quality protection.

In 2004, DES began coordinating efforts with several local organizations to develop the Volunteer Biological Assessment Program (VBAP). From 2006 through 2011, DES worked with the Green Mountain Conservation Group (GMCG), a non-profit charitable organization concerned with natural resource conservation in the Ossipee Watershed, to; (1) determine the level of volunteer interest and ability to collect biological data (2) evaluate the effectiveness of the VBAP protocol and associated biotic index, and (3) initiate and complete biological sampling of macroinvertebrates in several streams within the Ossipee watershed.

DES support for the VBAP program ended after the 2011 season due to state budget cutbacks. During the fall of 2012, GMCG continued this work with students and teachers from seven local schools. With the help of VBAP volunteers, they sampled eight rivers and streams in the Ossipee watershed.

2. METHODS

2.1 Sampling sites and data collection

All sites were accessible, wadeable, approximately 200 feet in length, and contained appropriate sampling habitat (at least one riffle, one pool, and one run with mixed cobble substrate). Sampling was scheduled throughout September and required two to four hours per site. Not all sites were equally accessible by students because of varying stream levels, but students were included in sampling and taking measurements whenever possible.

Prior to any sampling, a training session was held and consisted of three major components; (1) macroinvertebrate sampling techniques, (2) basic macroinvertebrate identification skills, and (3) biotic index computation methods. Volunteers were also trained to collect and record supplementary data which consisted of basic physical and chemical parameters.

2.2 Macroinvertebrate sampling

When collecting macroinvertebrates, students were split into two groups. One group collected macros while the other collected the site information including physical and chemical parameters. Once each group had a chance to complete their respective task the groups rotated. All students were given the opportunity to collect macros as well as collect stream assessment information. Five locations were sampled, approximately every 50 feet. A representative sample reach was identified and sketched on the Volunteer Biomonitoring Habitat Data Sheet. Students

recorded results, site information and measurements on the data sheets when appropriate. Volunteers were careful not to walk in the stream to avoid disturbing biological communities. Macroinvertebrates were collected by placing a 500 micron mesh kicknet perpendicular to stream flow and firmly against the streambed with the opening of the net faced upstream to promote macroinvertebrate collection. Another person stood upstream of the net and disturbed the sample area ($1/5$ m^2)

Kick net sampling at Lovell River, Ossipee

for a total of 60 seconds (30 second hand-scrub followed by a 30 second kick). Subsequently, the kicknet was carefully lifted out of the water and the same process was repeated four additional times with each sample collected further upstream. Collectively, active sampling time approximated five minutes within one square meter area in each stream.

Once the collection process was complete, the contents of the net were transferred into a sieve bucket fitted with 500 micron wire mesh and all organisms remaining on the net were carefully removed and added to the sample. The five samples were mixed and then divided into 4 approximately equal portions. This year, all four quarters were sorted by the students. In the past, following protocol, one portion of the sample was randomly selected for sorting and transferred to a separate tray(s). The remaining sample was kept in the wire mesh pan and submersed in a plastic basin with water to prevent the sample from drying.

2.3 Macroinvertebrate sorting and identification

For a timed 30 minutes, volunteers removed macroinvertebrates from the selected portion of the sample with spoons, forceps, or pipettes and placed them into separate containers. After sorting, specimens were identified to various coarse taxonomic groups (Table 1). According to protocol, the number of people sorting, cumulative sorting effort (0.5 hour x # people sorting), and approximate fraction of the total sample sorted are recorded.

Sorting at Cold River, Sandwich

Table 1. The taxonomic order and common name of aquatic macroinvertebrates identified in the VBAP.

Order	Common Name	Tolerance value
Ephemerotera	Mayfly nymph	3
Plecoptera	Stonefly nymph	1
Trichoptera	Caddisfly larvae	4
Odonata	Dragonfly nymph	3
	Damselfly nymph	7
Diptera	Black fly larvae	7
	Midge larvae	6
	Most true flies	4
Megaloptera	Alderfly	4
	Fishfly or helgrammite	0
Coleoptera	Riffle beetle	4
	Water penny	4
	Beetle and beetle-like	7
Others	Crayfish	6
	Snails	7
	Aquatic worms	8
	Scuds	8
	Sowbugs	7
	Clams and mussels	7

The number of macroinvertebrates within each taxonomic group and the total number of individuals sorted was calculated and recorded. Although a quality control (QC) sample was not taken at one site to evaluate the ability of volunteers to correctly identify and enumerate macroinvertebrates, at every site there were a number of trained amateur naturalists to assist with identification. According to protocol, in the future, a sample should be preserved and sent to DES or a trained biologist. This sample should be free of sand, leaf litter and other debris. Include only the macroinvertebrates and alcohol/water.

Volunteer identifying Macros at Cold Brook, Freedom.

2.4 Biotic index and accessory metric computation

Biotic scores were computed for each sample station using a standardized computational worksheet. Biotic scores are based on tolerance values ranging from 0 to 10 that are assigned to individual taxonomic groups. More tolerant groups have higher tolerance values and less tolerant groups have lower values. Taxonomic-specific biotic scores for individual samples were computed by multiplying the number of individuals by their respective tolerance value. Final biotic scores were calculated by summing the taxonomic-specific biotic scores and dividing the sum by the total number of individuals indentified in the respective sample. Final biotic scores correspond to three interim narrative categories: excellent (0 to 3.5), good (3.5 to 4.8), or fairly poor (greater than 4.8).

2.5 Supplementary data

The water chemistry and physical parameters of the stream were also recorded. Basic water chemistry data was collected using a YSI 556 multi-parameter submersible water quality probe and included pH, dissolved oxygen, conductivity, and water temperature. Turbidity samples were also collected using a Hach 2100p meter. Measurements of the stream were taken at the

beginning, middle, and end of the sample area. Both width of the stream and depth were recorded.

3. RESULTS

3.1 Water Quality

Basic water quality measures were collected at each of the sampling locations (Appendix B). All measures were within the range of expectation for streams in this area of New Hampshire. For more detailed water quality data on the water bodies in the Ossipee watershed, refer to the annual reports published by GMCG available at http://www.gmcg.org/water-quality-data.php


Probe used to collect water quality data

3.2 Biological Assessment

Macroinvertebrate samples from each site were evaluated using the VBAP biotic score index utilizing taxa-specific tolerance values. A cumulative biotic score for all sites and individual site-specific biotic scores were computed. The cumulative biotic score for all sites was 3.16 and corresponds to the "excellent" narrative category (Table 2). Overall, mayfly larvae was the most dominant taxon (32%), followed by caddisfly nymph (29%), stonefly (19%), and most true flies (4.8%) (Figure 1). Together, these four taxa comprised 85% of all individuals. In completing the sampling effort, volunteers collected and identified 1,300 macroinvertebrates.

Table 2. Cumulative of results of macroinvertebrate samples collected at eight sites in the Ossipee watershed during fall 2012.

Order	Common Name	Tolerance Value	Individuals Found	Group Biotic Score	Biotic Score	VBAP Category
Ephemeroptera	Mayfly Nymph	3	415	1245		
Plecoptera	Stonefly Nymph	1	249	249		
Trichoptera	Caddisfly Larvae	4	381	1524		
Odonata	Dragonfly Nymph	3	46	138		
	Damselfly Nymph	7	1	7		
Diptera	Black fly larvae	7	16	112		
	Midge larvae	6	16	96		
	Most True flies	4	63	252		
Megaloptera	Alderfly	4	3	12		
	Fishfly or Helgrammite	0	38	0		
Coleoptera	Riffle beetle	4	0	0		
	Water Penny	4	15	60		
	Beetle & Beetle-like	7	36	252		
Others	Crayfish	6	3	18		
	Snails	7	1	7		
	Aquatic Worms	8	14	112		
	Scuds	8	3	24		
	Sowbugs	7	0	0		
	Clams and Mussels	7	0	0		
Totals			**1300**	**4108**	**3.16**	**Excellent**

Figure 1. Cumulative taxonomic composition of macroinvertebrate samples collected at eight sites in the Ossipee watershed in fall 2012.
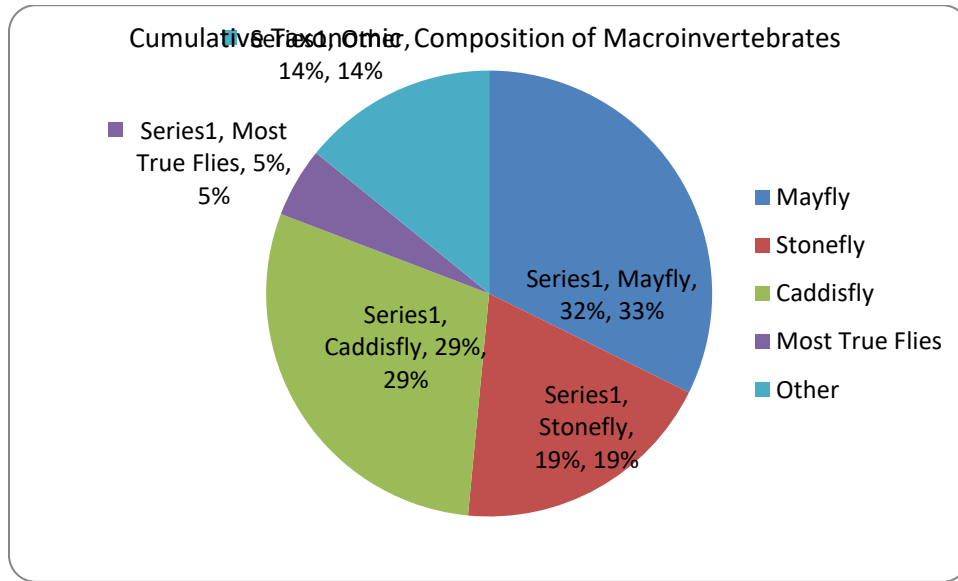
Biotic scores from individual sites ranged from 2.43 to 3.42 in 2012 (Table 3). Of the eight sites sampled all eight were placed in the "Excellent" category.

Table 3. Biotic scores and VBAP narrative categories of macroinvertebrate samples collected at eight sites in the Ossipee watershed during fall 2012.

Site Number	Stream Name	Town	Biotic Score	VBAP Narrative Category
1	Cold Brook	Freedom	2.95	Excellent
2	Beech River	Ossipee	3.25	Excellent
3	Bearcamp River	Tamworth	2.97	Excellent
4	Swift River	Tamworth	2.43	Excellent
5	Cold River	Sandwich	3.42	Excellent
6	Lovell River	Ossipee	2.60	Excellent
7	South River	Effingham	3.25	Excellent
8	Forrest Brook	Madison	3.40	Excellent

The total number of individuals identified at each site ranged from 43 to 331.

Figure 2: Taxonomic composition of macroinvertebrate samples collected at eight sites in the Ossipee watershed in fall 2012.

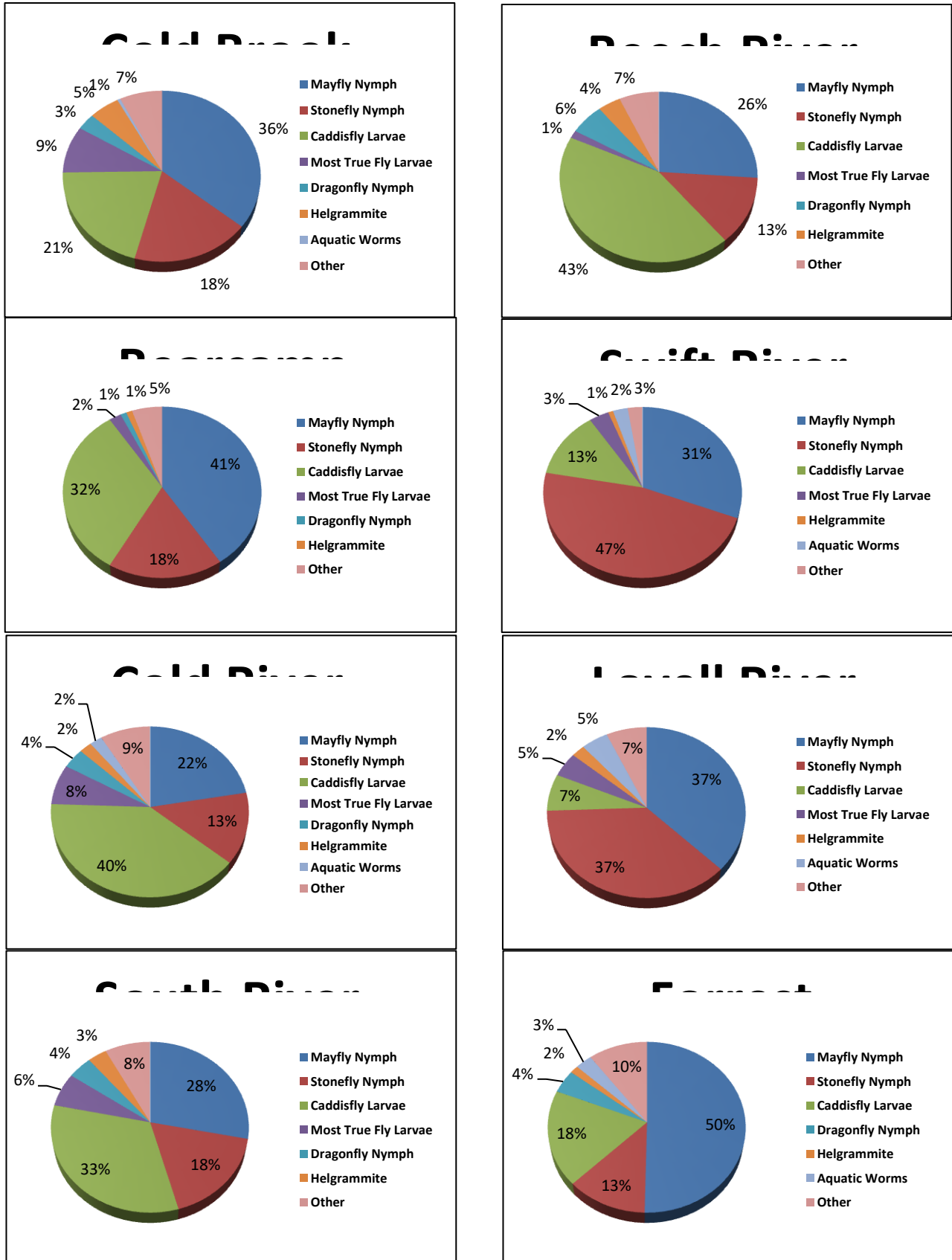## 4. SUMMARY AND FUTURE RECOMMENDATIONS

The documentation by volunteers of the macroinvertebrate communities using the VBAP protocol during the fall of 2012 in the Ossipee watershed represented the seventh consecutive year of screening efforts to evaluate the status of aquatic communities. The sampling efforts included eight sites in the Ossipee watershed, indicated on the maps in Appendix A. The VBAP protocol was designed by the DES to provide volunteers and water quality professionals who otherwise lacked formal training in biological sampling an avenue to complete "coarse" level investigations of the types and quantities of macroinvertebrates living in streams and rivers. Macroinvertebrates are widely used as indicators of water quality that integrate the effects of multiple pollutants over time. It is important to recognize that the results obtained from the VBAP protocol are not intended to represent formal water quality assessments, but rather, a basic indicator of aquatic community conditions.

The VBAP protocol also provided volunteers with an opportunity to become familiar with aquatic fauna in the streams and rivers in the Ossipee watershed. Collection of macroinvertebrates using the VBAP protocol, in addition to the usual chemical parameters collected by GMCG, proved to be a fairly simple yet informative method for identifying sites in excellent, good, or fairly poor condition. With adequate training volunteers became familiar with the most common macroinvertebrate types and their respective tolerance to pollution.

The results obtained by volunteers using the VBAP protocol indicated that all of sites sampled appeared to be in good condition. All eight of the streams fell into the "excellent" category. All of the communities were dominated by less pollution-tolerant macroinvertebrates, such as the mayflies, stoneflies, and caddisflies.

While the biotic index provided a method for relative comparisons of the sites sampled, the tolerance values and narrative categories are still under development and must be calibrated to a set of reference sites before statewide application is possible. The data collected builds upon a baseline to compare future VBAP sampling efforts against and highlights the general lack of major impacts to the macroinvertebrate communities at the points where samples were collected.

While the sampling efforts were effective at documenting the status of the macroinvertebrate communities at a coarse level, it is important to recognize that the project represented the effort by GMCG to refine and build upon the VBAP protocol. The DES Biomonitoring program developed the VBAP protocol and is continually refining the training provided to volunteers, field sampling techniques, and biotic index applicability. Therefore, more detailed investigations would need to be made in order to make a formal determination of biological community condition.

Ultimately, the results from the VBAP program for 2012 build upon the efforts conducted by GMCG and NH DES from the past several years. The results of the program serve as a basis for further monitoring and management practices to be put into use throughout the watershed. The Ossipee watershed has a great reputation for having great water quality overall and the VBAP results further that reputation. The VBAP results provide objective information to the public so that informed citizens have the ability to make good decisions regarding the Ossipee watershed's unique water resources.

APPENDIX A - MAPS OF 2012 MACROINVERTEBRATE SAMPLING LOCATIONS:

Site 1: Cold Brook, Freedom
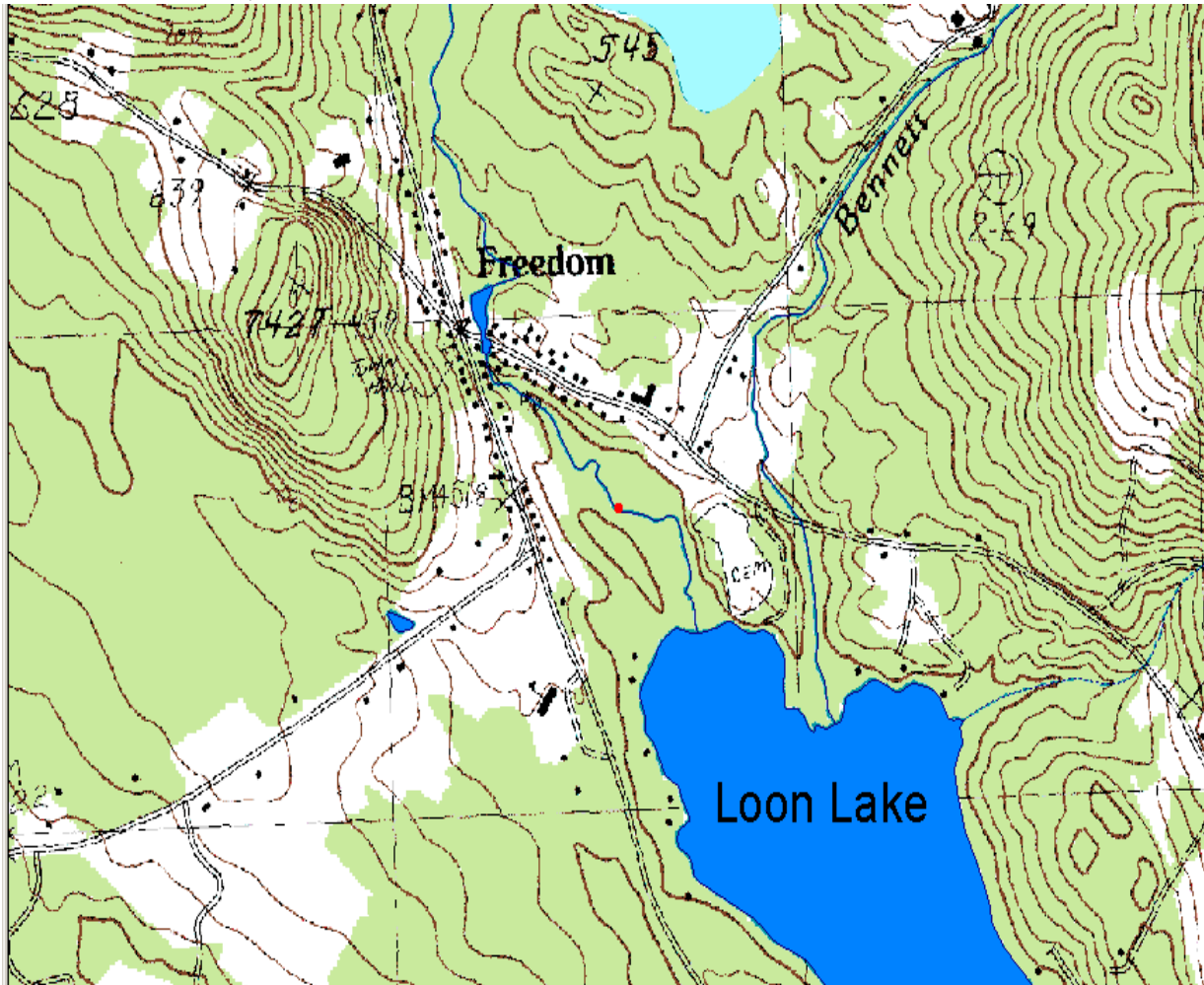
Site 2: Beech River, Ossipee
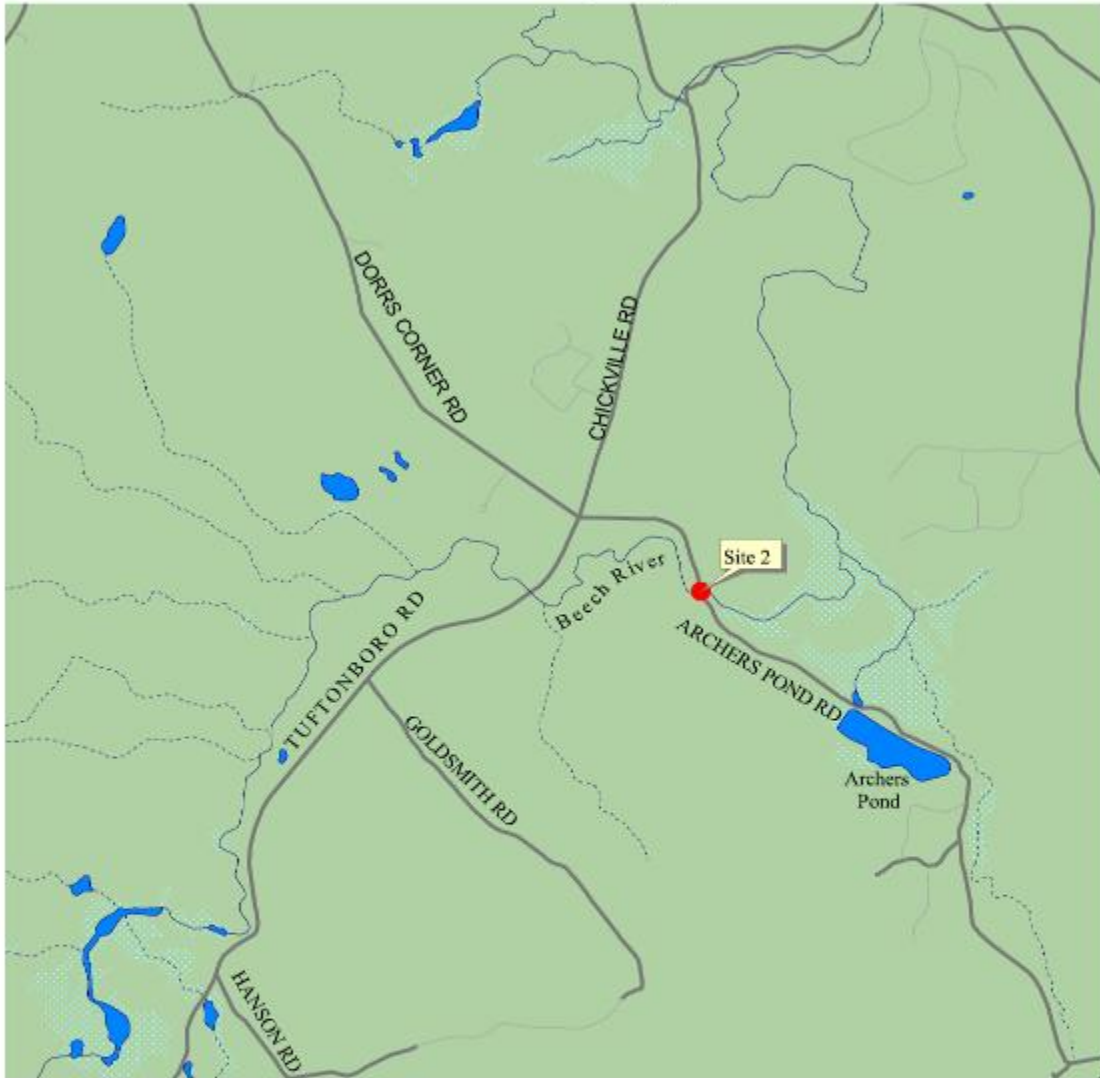
The coverages presented in this program are under constant revision as new sites or facilities are added. They may not contain all of the potential or existing sites or facilities. The Department is not responsible for the use or interpretation of this information, nor for any inaccuracies.

Map Prepared October 26, 2006.

0.3   0   0.3 Miles

N

LEGEND

	River, stream
	Intermittent stream
	Lake, pond
	Marsh, wetland
	Roads-private (NHDOT)
	Roads-fixes (NHDOT)
	Roads (NHDOT)

Site 3: Bearcamp River, Tamworth

Site 4: Swift River, Tamworth

NH RTE 1

Swift River

PAGE HILL RD

TURKEY ST

GREAT HILL RD

CHOCORUA RD

Site 4

Bryant Broo

CLEVELAND HILL RD

NH RTE 113

HOLLOW HILL RD

Mill Brook

DURRELL RD

DEPOT

TAM

N

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Map Prepared October 26, 2006.

0.3   0   0.3 Miles

LEGEND

River, stream	
Intermittent stream	
Lake, pond	
Marsh, wetland	
Roads-private (NHDOT)	
Roads-fixes (NHDOT)	
Roads (NHDOT)	

Site 5: Cold River, Sandwich
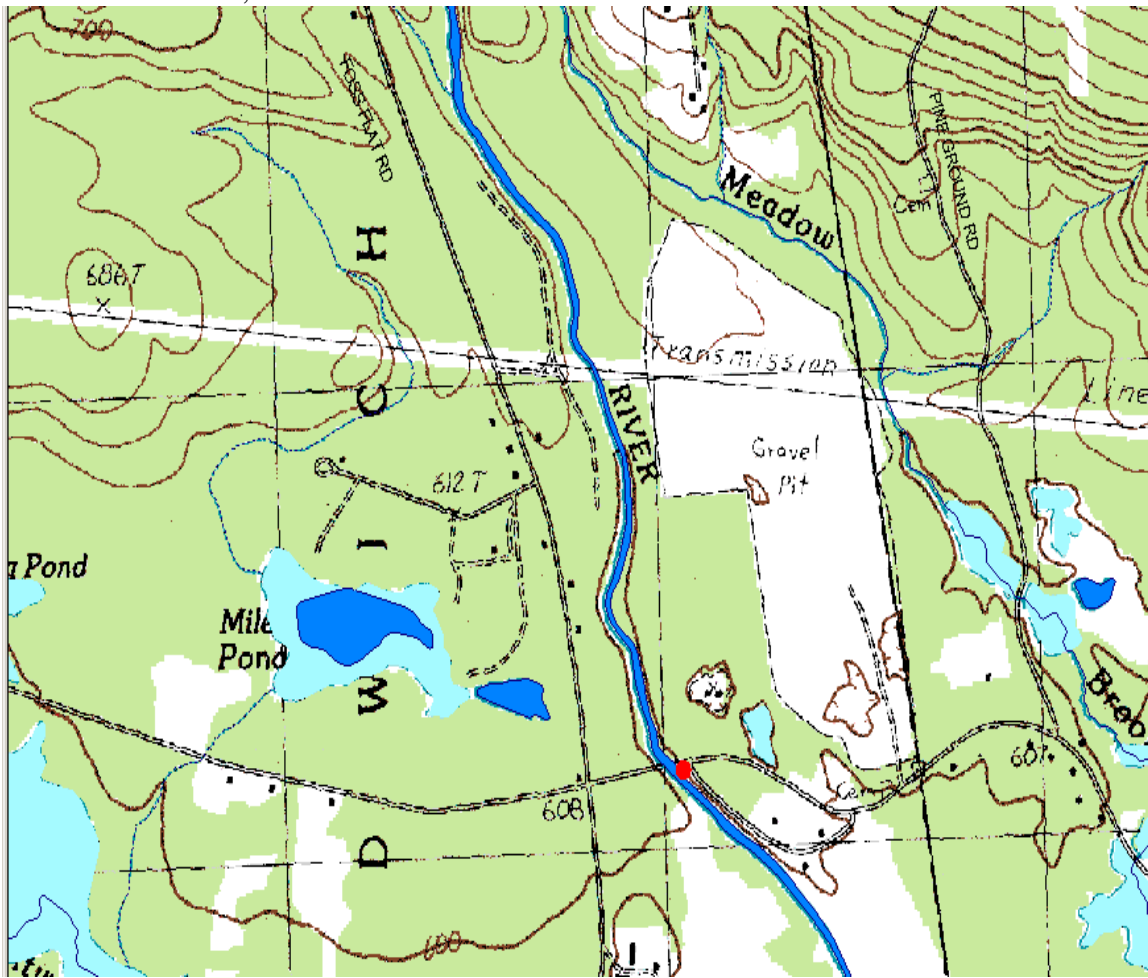
Site 6: Lovell River, Ossipee
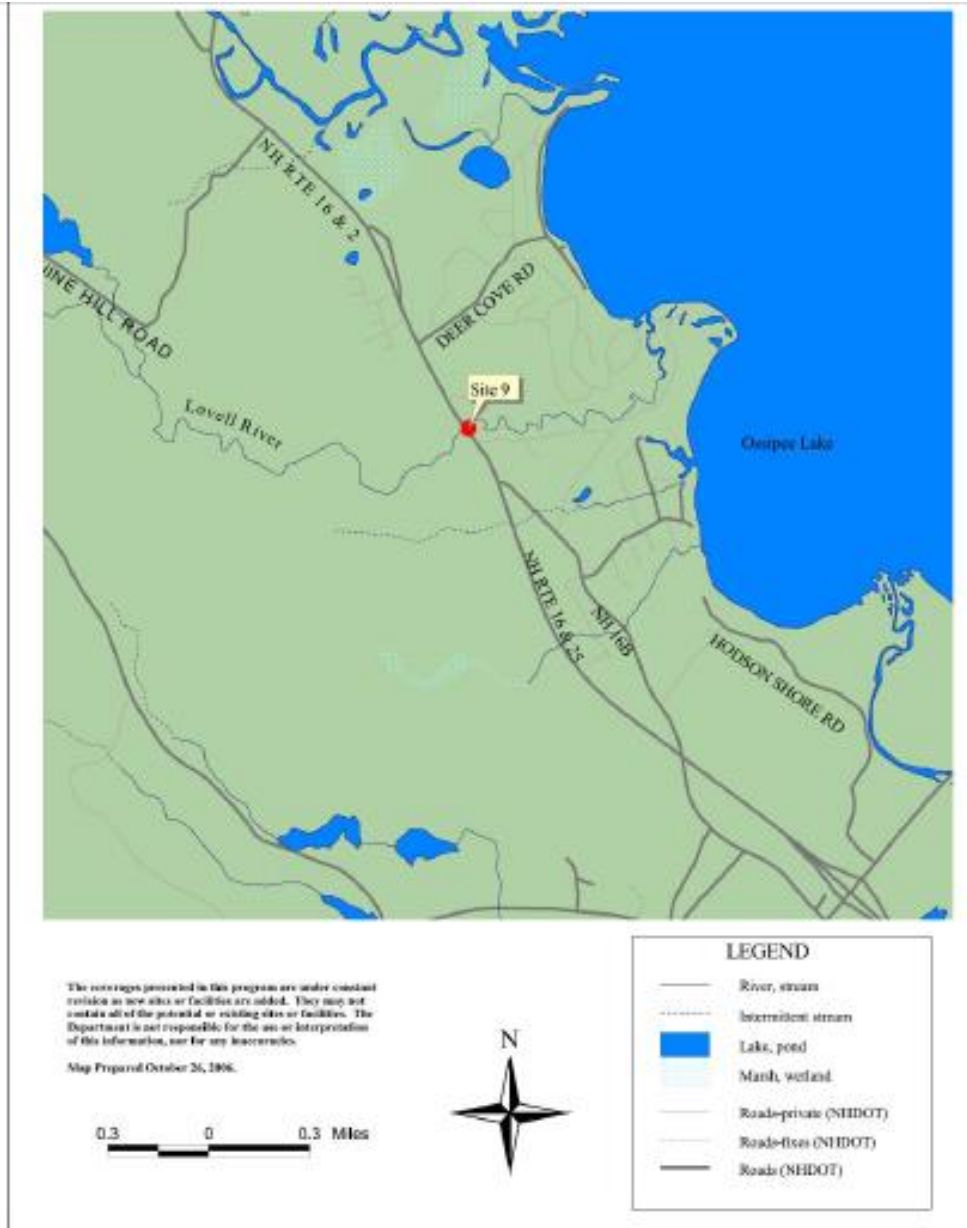
Site 7: South River, Parsonsfield, Maine

Site 8: Forrest Brook, Madison

The coverages presented in this program are under constant revision as new sites or facilities are added. They may not contain all of the potential or existing sites or facilities. The Department is not responsible for the use or interpretation of this information, nor for any inaccuracies.

Map Prepared October 26, 2006.

0.3   0   0.3   Miles

N

LEGEND
— River, stream
----- Intermittent stream
■ Lake, pond
  Marsh, wetland
— Roads–private (NHDOT)
— Roads–fixes (NHDOT)
— Roads (NHDOT)

APPENDIX B - BASIC WATER QUALITY PARAMETER RESULTS COLLECTED AT VBAP SAMPLING SITES IN THE OSSIPEE WATERSHED DURING FALL 2012.

Site Number	Stream Name	pH (units)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Temperature (°C)	Conductivity (µS/cm)
1	Cold Brook	6.43	93.5	9.97	11.95	74
2	Beech River	6.99	86.4	na	11.65	44
3	Bearcamp River	6.12	108.8	na	17.80	32
4	Swift River	5.55	100.4	11.66	8.75	28
5	Cold River	6.34	95.6	9.15	17.40	23
6	Lovell River	na	97.4	10.04	9.68	20
7	South River	5.81	70.2	7.45	12.03	57
8	Forrest Brook	5.61	92.5	10.35	10.40	72
	Averages	**6.57**	**93.1**	**9.77**	**12.46**	**44**

Note: na = not available;

APPENDIX C - MACROINVERTEBRATE SAMPLING RESULTS FROM INDIVIDUAL STREAM SITES SAMPLED IN THE OSSIPEE WATERSHED DURING FALL 2012

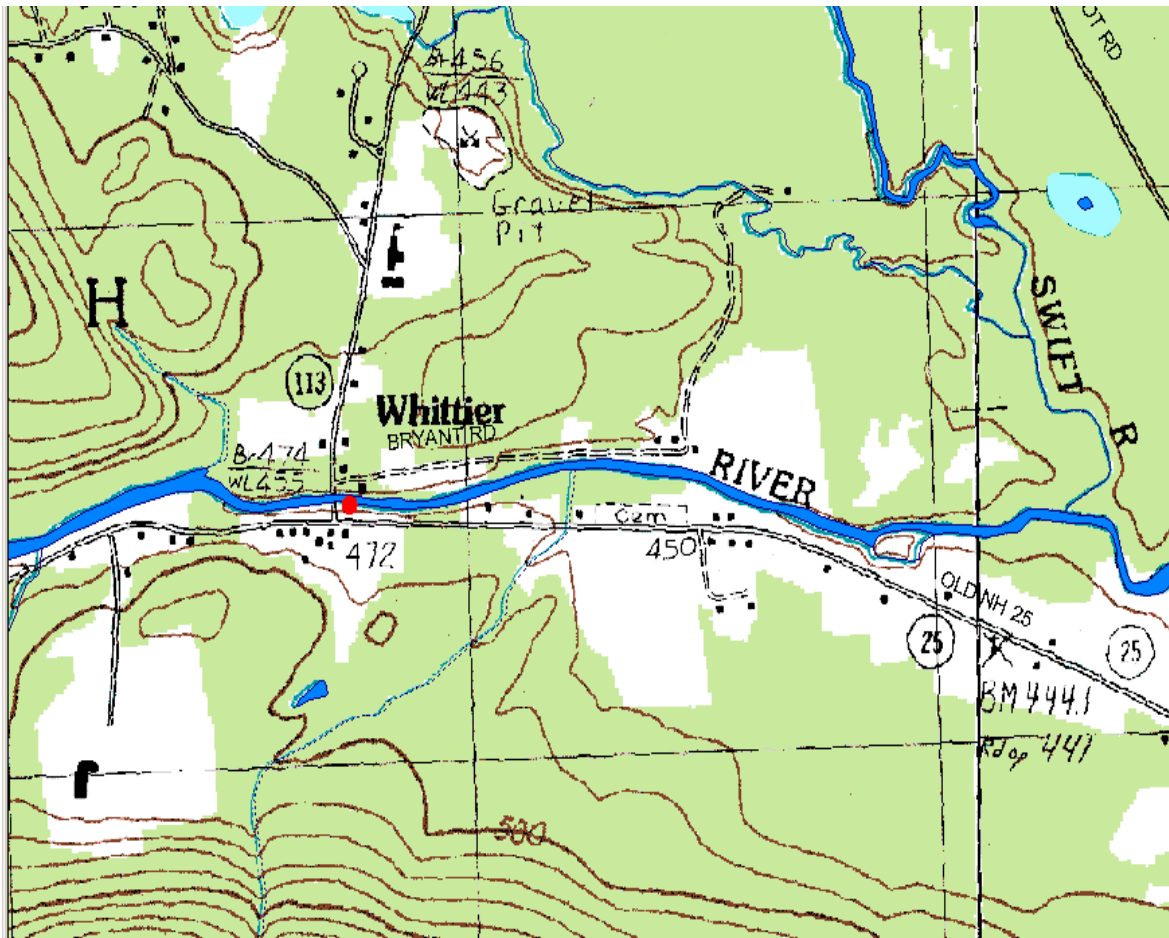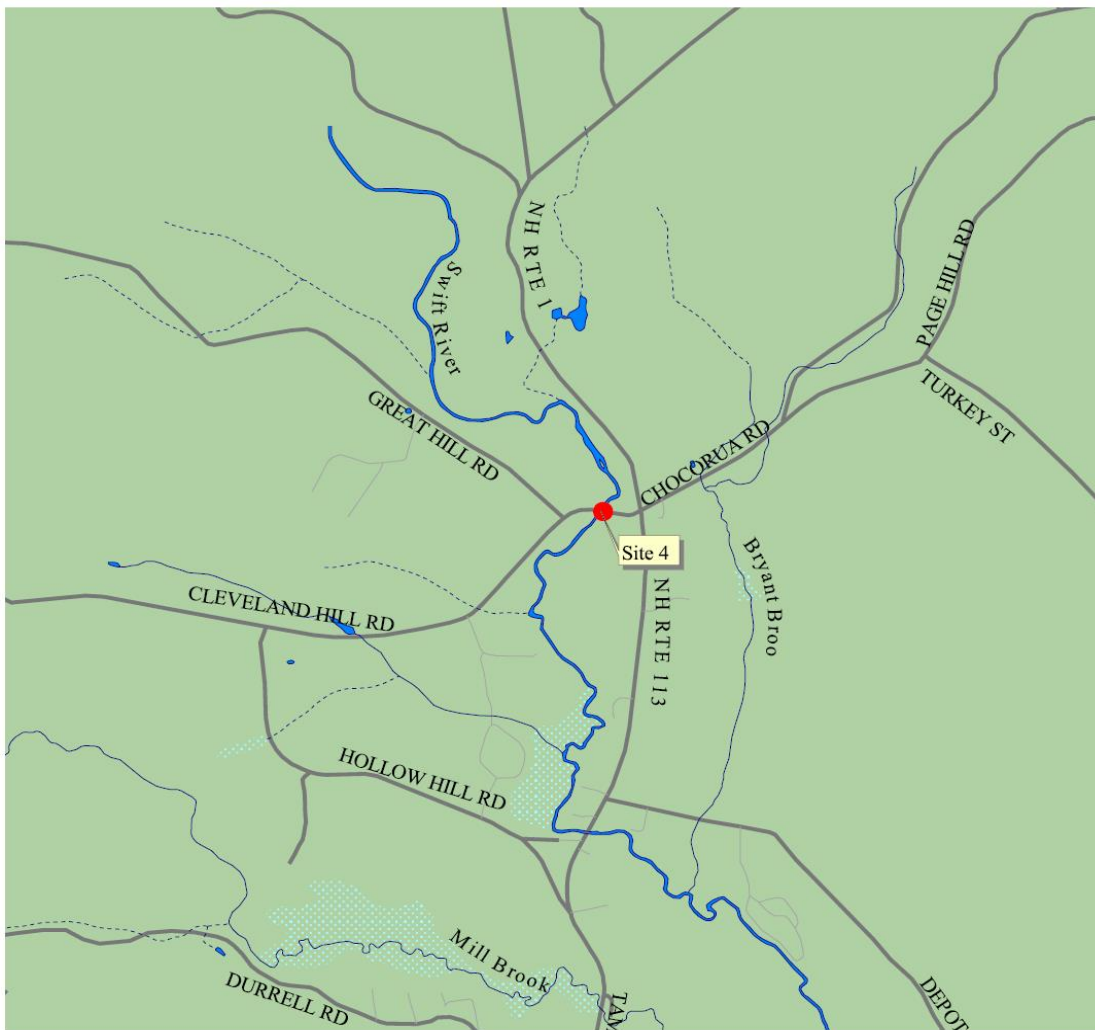**Site 1**: Cold Brook, Freedom

Order	Common Name	Tolerance Value	*	Totals Found	=	Biotic Score	Final Biotic Score	VBAP Narrative Category
Ephemeroptera	Mayfly Nymph	3	*	68		204		
Plecoptera	Stonefly Nymph	1	*	35		35		
Trichoptera	Caddisfly Larvae	4	*	39	=	156		
Odonata	Dragonfly Nymph	3	*	6	=	18		
	Damselfly Nymph	7	*	0	=	0		
Diptera	Black fly larvae	7	*	4	=	28		
	Midge larvae	6	*	0	=	0		
	Most True flies	4	*	17	=	68		
Megaloptera	Alderfly	4	*	0	=	0		
	Fishfly or Helgrammite	0	*	10	=	0		
Coleoptera	Riffle beetle	4	*	0	=	0		
	Water Penny	4	*	8	=	32		
	Beetle & Beetle-like	7	*	1	=	7		
Others	Crayfish	6	*	1	=	6		
	Snails	7	*	0	=	0		
	Aquatic Worms	8	*	1	=	8		
	Scuds	8	*	0	=	0		
	Sowbugs	7	*	0	=	0		
	Clams and Mussels	7	*	0	=	0		
Totals				**190**		**562**	**2.95**	**Excellent**

Appendix C (con't). Macroinvertebrate sampling results from individual stream sites sampled in the Ossipee watershed during fall 2012.

Site 2. Beech River, Ossipee

Order	Common Name	Tolerance Value	*	Totals Found	=	Biotic Score	Biotic Score	Narrative Category
Ephemeroptera	Mayfly Nymph	3	*	53	=	159		
Plecoptera	Stonefly Nymph	1	*	26	=	26		
Trichoptera	Caddisfly Larvae	4	*	87	=	348		
Odonata	Dragonfly Nymph	3	*	12	=	36		
	Damselfly Nymph	7	*	0	=	0		
Diptera	Black fly larvae	7	*	0	=	0		
	Midge larvae	6	*	1	=	6		
	Most True flies	4	*	3	=	12		
Megaloptera	Alderfly	4	*	0	=	0		
	Fishfly or Helgrammite	0	*	8	=	0		
Coleoptera	Riffle beetle	4	*	0	=	0		
	Water Penny	4	*	6	=	24		
	Beetle & Beetle-like	7	*	6	=	42		
Others	Crayfish	6	*	0	=	0		
	Snails	7	*	0	=	0		
	Aquatic Worms	8	*	0	=	0		
	Scuds	8	*	1	=	8		
	Sowbugs	7	*	0	=	0		
	Clams and Mussels	7	*	0	=	0		
Totals				**203**		**661**	**3.25**	**Excellent**

Site 3. Bearcamp River, Tamworth

Order	Common Name	Value	*	Found	=	Score	Score	Category
Ephemeroptera	Mayfly Nymph	3	*	39	=	108		
Plecoptera	Stonefly Nymph	1	*	17	=	17		
Trichoptera	Caddisfly Larvae	4	*	31	=	124		
Odonata	Dragonfly Nymph	3	*	1	=	3		
	Damselfly Nymph	7	*	0	=	0		
Diptera	Black fly larvae	7	*	0	=	0		
	Midge larvae	6	*	4	=	24		
	Most True flies	4	*	2	=	8		
Megaloptera	Alderfly	4	*	0	=	0		
	Fishfly or Helgrammite	0	*	1	=	0		
Coleoptera	Riffle beetle	4	*	0	=	0		
	Water Penny	4	*	0	=	0		
	Beetle & Beetle-like	7	*	0	=	0		
Others	Crayfish	6	*	0	=	0		
	Snails	7	*	1	=	7		
	Aquatic Worms	8	*	0	=	0		
	Scuds	8	*	0	=	0		
	Sowbugs	7	*	0	=	0		
	Clams and Mussels	7	*	0	=	0		
Totals				**96**		**285**	**2.97**	**Excellent**

Appendix C (con't). Macroinvertebrate sampling results from individual stream sites sampled in the Ossipee watershed during fall 2012.

Site 4. Swift River, Tamworth

Order	Common Name	Value	*	Found	=	Score	Score	Category
Ephemeroptera	Mayfly Nymph	3	*	36	=	108		
Plecoptera	Stonefly Nymph	1	*	55	=	55		
Trichoptera	Caddisfly Larvae	4	*	15	=	60		
Odonata	Dragonfly Nymph	3	*	0	=	0		
	Damselfly Nymph	7	*	0	=	0		
Diptera	Black fly larvae	7	*	3	=	21		
	Midge larvae	6	*	0	=	0		
	Most True flies	4	*	4	=	16		
Megaloptera	Alderfly	4	*	0	=	0		
	Fishfly or Helgrammite	0	*	1	=	0		
Coleoptera	Riffle beetle	4	*	0	=	0		
	Water Penny	4	*	0	=	0		
	Beetle & Beetle-like	7	*	0	=	0		
Others	Crayfish	6	*	0	=	0		
	Snails	7	*	0	=	0		
	Aquatic Worms	8	*	3	=	24		
	Scuds	8	*	0	=	0		
	Sowbugs	7	*	0	=	0		
	Clams and Mussels	7	*	0	=	0		
Totals				**117**		**284**	**2.43**	**Excellent**

Site 5. Cold River, Sandwich

Order	Common Name	Value	*	Found	=	Score	Score	Category
Ephemeroptera	Mayfly Nymph	3	*	41	=	123		
Plecoptera	Stonefly Nymph	1	*	25	=	25		
Trichoptera	Caddisfly Larvae	4	*	73	=	292		
Odonata	Dragonfly Nymph	3	*	7	=	21		
	Damselfly Nymph	7	*	0	=	0		
Diptera	Black fly larvae	7	*	0	=	0		
	Midge larvae	6	*	8	=	48		
	Most True flies	4	*	14	=	56		
Megaloptera	Alderfly	4	*	0	=	0		
	Fishfly or Helgrammite	0	*	4	=	0		
Coleoptera	Riffle beetle	4	*	0	=	0		
	Water Penny	4	*	1	=	4		
	Beetle & Beetle-like	7	*	7	=	49		
Others	Crayfish	6	*	0	=	0		
	Snails	7	*	0	=	0		
	Aquatic Worms	8	*	4	=	32		
	Scuds	8	*	0	=	0		
	Sowbugs	7	*	0	=	0		
	Clams and Mussels	7	*	0	=	0		
Totals				**184**		**630**	**3.42**	**Excellent**

Appendix C (con't). Macroinvertebrate sampling results from individual stream sites sampled in the Ossipee watershed during fall 2012.

Site 6. Lovell River, Ossipee

Order	Common Name	Value	*	Found	=	Score	Score	Category
Ephemeroptera	Mayfly Nymph	3	*	16	=	48		
Plecoptera	Stonefly Nymph	1	*	16	=	16		
Trichoptera	Caddisfly Larvae	4	*	3	=	12		
Odonata	Dragonfly Nymph	3	*	0	=	0		
	Damselfly Nymph	7	*	0	=	0		
Diptera	Black fly larvae	7	*	0	=	0		
	Midge larvae	6	*	0	=	0		
	Most True flies	4	*	2	=	8		
Megaloptera	Alderfly	4	*	3	=	12		
	Fishfly or Helgrammite	0	*	1	=	0		
Coleoptera	Riffle beetle	4	*	0	=	0		
	Water Penny	4	*	0	=	0		
	Beetle & Beetle-like	7	*	0	=	0		
Others	Crayfish	6	*	0	=	0		
	Snails	7	*	0	=	0		
	Aquatic Worms	8	*	2	=	16		
	Scuds	8	*	0	=	0		
	Sowbugs	7	*	0	=	0		
	Clams and Mussels	7	*	1	=	0		
Totals				**43**		**112**	**2.60**	**Excellent**

Site 7. South River, Parsonsfield (Effingham Elementary School tested)

Order	Common Name	Value	*	Found	=	Score	Score	Category
Ephemeroptera	Mayfly Nymph	3	*	93	=	279		
Plecoptera	Stonefly Nymph	1	*	58	=	58		
Trichoptera	Caddisfly Larvae	4	*	108	=	432		
Odonata	Dragonfly Nymph	3	*	14	=	42		
	Damselfly Nymph	7	*	1	=	7		
Diptera	Black fly larvae	7	*	8	=	56		
	Midge larvae	6	*	0	=	0		
	Most True flies	4	*	21	=	84		
Megaloptera	Alderfly	4	*	0	=	0		
	Fishfly or Helgrammite	0	*	11	=	0		
Coleoptera	Riffle beetle	4	*	0	=	0		
	Water Penny	4	*	0	=	0		
	Beetle & Beetle-like	7	*	12	=	84		
Others	Crayfish	6	*	2	=	12		
	Snails	7	*	0	=	0		
	Aquatic Worms	8	*	0	=	0		
	Scuds	8	*	2	=	16		
	Sowbugs	7	*	0	=	0		
	Clams and Mussels	7	*	1	=	7		
Totals				**331**		**1077**	**3.25**	**Excellent**

Appendix C (con't). Macroinvertebrate sampling results from individual stream sites sampled in the Ossipee watershed during fall 2012.

Site 8. Forrest Brook, Madison

Order	Common Name	Value	*	Found	=	Score	Score	Category
Ephemeroptera	Mayfly Nymph	3	*	69	=	207		
Plecoptera	Stonefly Nymph	1	*	17	=	17		
Trichoptera	Caddisfly Larvae	4	*	25	=	100		
Odonata	Dragonfly Nymph	3	*	6	=	18		
	Damselfly Nymph	7	*	0	=	0		
Diptera	Black fly larvae	7	*	1	=	7		
	Midge larvae	6	*	3	=	18		
	Most True flies	4	*	0	=	0		
Megaloptera	Alderfly	4	*	0	=	0		
	Fishfly or Helgrammite	0	*	2	=	0		
Coleoptera	Riffle beetle	4	*	0	=	0		
	Water Penny	4	*	0	=	0		
	Beetle & Beetle-like	7	*	10	=	70		
Others	Crayfish	6	*	0	=	0		
	Snails	7	*	0	=	0		
	Aquatic Worms	8	*	4	=	32		
	Scuds	8	*	0	=	0		
	Sowbugs	7	*	0	=	0		
	Clams and Mussels	7	*	0	=	0		
Totals				**137**		**469**	**3.40**	**Excellent**