

Hoosic River Watershed Association

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The Battenkill Conservancy and the Hoosic River Watershed Association are member funded, non-profit organizations dedicated to the protection of water resources and proactive monitoring.

This project has provided valuable data to the VT DEC, identifying several previously unassessed streams to be more impaired than expected. The VT DEC is currently taking action to follow up on these results by conducting a second year of assessments in order to gain additional data to support further action.



This project was funded, in part, by the Vermont Watershed Grants and the Conservation License Plate Program. http://www.anr.state.vt.us

For additional information regarding biomonitoring, biological indicators, field and laboratory methods and Vermont Department of Environmental Conservation, Biomonitoring and Aquatic Studies Section please visit www.http://www.vtwaterguality.org/bass.htm



Ladd Brook



Jewett Brook



Cold Spring Brook

VERMONT UNASSESSED WATERS PROJECT: HOOSIC WATERSHED*

SPONOSORED BY BATTENKILL CONSERVANCY AND HOOSIC RIVER WATERSHED ASSOICATION ADDITIONAL FUNDING FROM VERMONT WATERSHED GRANTS AGENCY OF NATURAL RESOURCES: DEPARTMENT OF FISH & WILDLIFE

In 2007 the Battenkill Conservancy (BC) and Hoosic River Watershed Association (HooRWA) initiated the project Vermont's Unassessed Waters: Stream Biomonitoring within the Battenkill, Walloomsac, and Hoosic Watersheds.

This project is part of an overall plan to augment existing data for the Vermont Department of Environmental Conservation (VT DEC) and to assist state and local officials with water supply planning, watershed protection, recreational resources, and habitat protection. The project is also intended to inform on the water quality conditions in Vermont streams and rivers that have not been previously assessed by the VT DEC. The information obtained may also be used to upgrade current stream segments designated use classifications and to expand and aid evaluation of water quality within these watersheds.

Benthic macroinvertebrates are abundant in most streams, relatively long-lived, and exhibit varied tolerance to environmental impacts (i.e., sediment pollution, habitat modification); these characteristics enable us to infer the biological condition of an aquatic ecosystem through calculation of widely employed metrics based on community attributes (i.e., taxa richness, abundance, tolerance).

The purpose of this publication is to communicate the project results and to enhance public awareness of regional water quality. Thirteen stations were sampled in 2008 following VT DEC protocols: benthic macroinvertebrate collection, habitat assessment, and laboratory sample processing. This report focuses on the Hoosic Watershed results; please see the Battenkill Watershed publication for detailed results from the Battenkill Watershed.



Tubbs Creek

*See Battenkill Watershed publication for specific Battenkill Watershed results.

City Stream

Little White Creek

Location	Community Assessment*	Assessment Description	
Barney Brook	Fair	Moderate taxa richness and density; low EPT richness. Elevated biotic index; low similarity to reference community composition and reference functional feeding group structure. Slightly elevated percent Oligochaeta taxa.	
City Stream	Excellent	Low density, high EPT and taxa richness, and low biotic index score indicates very high quality low nutrient stream. Functional feeding groups similar to small high gradient stream type; the most abundant taxa were native sensitive taxa. Water quality results indicated moderate alkalinity, circum-neutral pH and low phosphorous.	
Cold Spring Brook	Excellent-Very good	Moderate density, high EPT and taxa richness, however biotic index, EPT/EPTChironomidae were moderately elevated. Community structure was slightly different than small high gradient stream type. Caddisfly taxa dominated indicating possible enrichment. Sediment pollution unlikely due to low Oligocheata abundance. Herbivorous shredders and scrapers functional feeding groups were elevated. Water samples indicated low phosphorous and high alkalinity.	
Jewett Brook	Fair	Density and biotic index were moderately high; taxa richness was good, however, EPT richness was below expectations for a small high gradient stream type. Stonefly taxa were not observed and taxa were dominated by warm water taxa. Water quality data showed elevated phosphorous concentration, high alkalinity, and high ph (> 8). Site does not meet Class B aquatic life use due to low representation of mayfly and stonefly taxa.	
Ladd Brook	Fair	Density, EPT, and taxa richness was low. Oligochaeta was 40% of sample indicating high potential for sediment impact. Physical features indicated high silt rating and widening and filling of stream channel. Functional feed group composition was largely composed of collector-gatherers and low in shredders and scrapers.	
Little White Creek	Very good	Density was moderate and EPT and taxa richness were very high. Biotic index was low and EPT/EPT-Chironomidae was high indicating high biological integrity with possible slight enrichment. May be slight sediment stress as indicated by percent Oligochaeta deviation from reference.	
Stamford Brook	Very good- Good	Density moderately high and slightly elevated biotic index. Taxa richness and EPT richness were high. This metric combination may indicate moderate to minor enrichment. Water quality data indicated low pH (6.85) and alkalinity. The herbivorous shredder functional feeding group was elevated.	
Tubbs Creek	Fair	Density moderate, taxa richness was very good, however EPT richness was low. Composition was composed of 24% Oligochaeta, otherwise community structure was similar to reference community. Stonefly and caddisfly taxa were low compared to the small high gradient stream type. Based on the functional feeding groups composition and substrate composition suggest possible sediment impacts.	

*Community assessments and assessment descriptions were determined by VT DEC biologists using multiple metrics, comparisons to reference conditions, historical data, and professional experience.

Metric	Description	Interpretation
Taxa Richness	Number of unique taxa present in a sample	Higher richness indicates better condition
Density	Relative abundance of taxa in a sample	Higher densities may indicate better condition
EPT Index	Number of species in the sample in the generally more intolerant orders Ephemeroptera, Plecoptera, and Trichoptera (mayfly, stonefly, caddisfly)	Higher richness indicates better condition; generally taxa in these orders are pollution sensitive
EPT/EPT & Chironomidae	Measure of the ratio of the abundance of the intolerant EPT orders to the generally tolerant Diptera family Chironomidae (midges)	The higher the ratio indicates better condition
% Oligochaeta	Percent of the macroinvertebrate community made up of the Order Oligochaeta (worms)	Higher percentages indicates poorer condition
Percent Model Affinity of Orders - (PMA-O)	Measure of order level similarity to a model based on the reference streams Novak and Bode (1992).	Higher percentages indicate condition similar to reference community structure
Hilsenhoff Biotic Index- BI (0-10)	Measure of the macroinvertebrate assemblage tolerance toward organic (nutrient) enrichment Hilsenhoff (1987)	Higher values indicate poorer condition
Pinkham-Pearson Coefficient of Similarity - Functional Groups - (PPCS-F	Measure of functional feeding group (scrapers, filterers, predators) similarity to a model based on the reference streams	Higher percentages indicate condition similar to reference community structure

