



## *Connecticut River Watch Program*

# HOCKANUM RIVER RAPID BIOASSESSMENT SUMMARY REPORT



Funded in part by the CT DEP through a US EPA Clean Water Act §319 nonpoint source grant



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Hockanum River Rapid Bioassessment Summary Report  
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December 2002

With funding from the Connecticut Department of Environmental Protection through a US Environmental Protection Agency Clean Water Act §319 nonpoint source grant, in cooperation with the Hockanum River Watershed Association

## **INTRODUCTION**

During the fall of 2002 the Connecticut River Watch Program (CRWP), in cooperation with the Hockanum River Watershed Association and the Connecticut Department of Environmental Protection (DEP), conducted a rapid bioassessment of the Hockanum and Tankerhoosen Rivers. Teams of volunteers, including riparian landowners, land use commissioners, members of the Hockanum River Watershed Association and the Hockanum River Linear Park Committee, a science teacher and students from Rockville High School, and members of the community assisted with the bioassessment, a survey of the benthic macroinvertebrate community following the DEP protocol: *Rapid Bioassessment in Wadeable Streams and Rivers by Volunteer Monitors*.

The monitoring project was the third component of an effort to assess the health of the Hockanum River begun in 1999. The study began with a physical survey of the Hockanum River, and continued in 2000 with a physical survey of the Tankerhoosen River. It is our hope that the effort will evolve into a long-term community-based monitoring and assessment program, designed to help insure the improvement and protection of this valuable resource.

Goals of the monitoring program include: to collect baseline information about the condition of the Hockanum River and its tributaries; to identify areas of the river in need of protection or restoration; and to raise community awareness of the River and the need to restore and protect it. Information collected will be used to identify, plan and prioritize conservation and improvement efforts. The CRWP monitoring program is intended to complement and build upon ongoing efforts to improve conditions in the watershed and raise public awareness of the river.

## **BACKGROUND**

### **The Hockanum River Watershed**

The Hockanum River is a major tributary of the Connecticut River located in north central Connecticut. From its beginnings in Shenipsit Lake in Ellington, the Hockanum flows approximately twenty-five (25) miles to its confluence with the Connecticut River in East Hartford. The River's watershed comprises a seventy-seven (77) square mile area draining large portions of Ellington, Tolland, Vernon and Manchester, and smaller portions of Somers, Stafford, Bolton and East Hartford. While areas of the watershed are undeveloped, the Hockanum flows through an increasingly urbanized landscape as it travels downstream. The River also assimilates waste from three sewage treatment plants.

The Hockanum River is included in Connecticut's Unified Watershed Assessment as a category 1 (impaired) watershed, and was recommended for monitoring/assessment by the Department of Environmental Protection (DEP) ambient monitoring group. The River is on DEP's list of impaired waters (Vernon to Mouth), with impairments listed as aquatic life support, contact recreation/bacteria, and inadequate fish passage. Suspected causes of these water quality impairments include agriculture, landfills, highway maintenance and runoff, urban runoff and wet weather discharges. Shenipsit Lake is also included on the list due to flow modification from public water supply diversion.

Despite its water quality problems, the Hockanum River is a well-used recreational resource. An annual spring canoe race brings many enthusiasts to the river. The Hockanum River Linear Park not only protects areas of the river and riparian habitats, but also contains a network of riverside hiking trails. The trails provide casual hikers the opportunity to enjoy the natural beauty of the river, even in some bustling commercial areas. Further, the presence and use of the Linear Trail helps to promote stewardship of the river.

## **Hockanum River Restoration Efforts**

The Hockanum River has been the focus of a number of local and regional efforts to improve its health. In 1995, the Tolland and Hartford County Soil and Water Conservation Districts initiated a watershed management project with funding from the DEP through a grant from the US Environmental Protection Agency (EPA) under Section 319 of the Clean Water Act. Activities undertaken as part of this project have focused on identifying and reducing pollution problems associated with storm water runoff, and restoring fish and wildlife habitat.

Five different restoration and stabilization projects in the Hockanum River and tributaries have been funded through the DEP River Restoration Grant program, one in East Hartford, two in Vernon, and two in Manchester. Three of these projects have been completed, and the rest are in the planning stages.

The Hockanum River Watershed Association (HRWA) sponsors periodic river clean-ups, in addition to other outreach and education activities, and town based Hockanum River Linear Park committees in Manchester and Vernon create and maintain a network of trails.

## **About the Hockanum River Study**

The Connecticut River Watch Program is working in conjunction with the Hockanum River Watershed Association (HRWA) and the Tolland County Soil and Water Conservation District to develop and support a community-based river monitoring and assessment program in the Hockanum River watershed. This effort is part of the expanded Connecticut River Watch Program, and is one the new watershed monitoring and assessment programs initiated in 1999 as part of this new basin-wide program.

The Hockanum River is included in Connecticut's Unified Watershed Assessment as a category 1 (impaired) watershed, and was recommended for monitoring/assessment by the Department of Environmental Protection (DEP) ambient monitoring group. The CRWP monitoring program is intended to complement and enhance existing efforts to improve conditions in the watershed and raise public awareness of the river by the HRWA, the Linear Park committees, the Tolland and Hartford County Conservation Districts, and the watershed municipalities. Improvements have been implemented as part of a watershed management project funded by the DEP through a U.S. Environmental Protection Agency §319 nonpoint source grant watershed project. In 1998, CRWP was asked by the DEP and EPA to help develop a volunteer monitoring program in conjunction with the watershed project.

The study began in 1999 with a Stream Walk Survey—a survey of physical characteristics—of the Hockanum River main stem, and continued in 2000 with a similar survey of the Tankerhoosen River, the Hockanum's major tributary. The surveys were conducted with assistance from members of the Hockanum River Watershed Association and the watershed community.

A number of management considerations were raised by the surveys. In the Hockanum, much of the river appeared to be impacted adversely by human development as evidenced by inadequate stream buffers, adjacent residential, commercial and industrial development, non-native invasive plants, yard waste, algae growth, exposed streambank soils, and sedimentation. At the same time, in areas protected by the Hockanum River Linear Park, the river seems to support a diversity of wildlife, as well as provide many opportunities for public access and recreation. In the Tankerhoosen, similar problems were uncovered, though several areas of the river appear to be in relatively good condition, both upstream and downstream. Also, there are very few areas where stream buffers are less than 25 feet and where there are lawns adjacent to the stream. Further, numerous opportunities for recreational

access and use were identified in the survey; development and use of new access areas will help to heighten awareness of the river's values and promote stewardship activities. Recommendations included completing the collection of baseline information by surveying other streams in the watershed, and conducting additional river monitoring activities to assess in-stream health.<sup>1</sup>

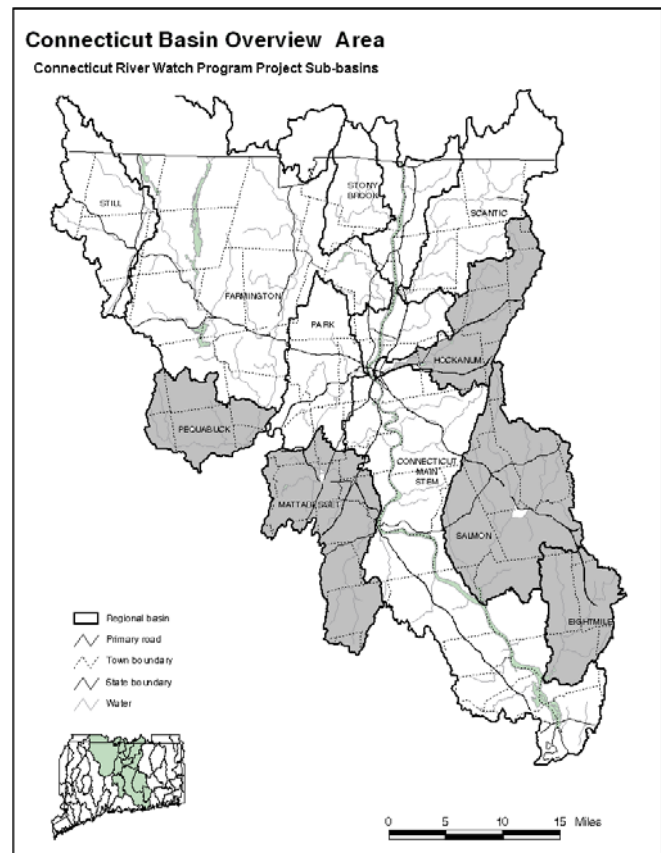
### The Connecticut River Watch Program

The Connecticut River Watch Program (CRWP) is a volunteer water quality monitoring, protection and improvement program for the Connecticut River and its tributaries. CRWP is sponsored by the Middlesex County Soil and Water Conservation District and was initiated in 1992 in cooperation with River Watch Network, a national organization based in Vermont.

Over its first eight years CRWP focused its monitoring activities on the lower Connecticut River main stem and two tributary watersheds, the Mattabeset and the Coginchaug. The program has generated an extensive water quality database for these rivers, and raised local awareness of river resources and water quality issues through public involvement and outreach activities.

Information collected through CRWP has been used by towns to investigate potential sources of pollution, and by the state for planning purposes. It has become a model program, with wide support from the local communities and state and federal environmental officials. Funding for CRWP has come primarily from the DEP through grants from the US EPA under Section 319 of the Clean Water Act.

In 1999, CRWP expanded into new watersheds within the Connecticut River basin. Now a regional support service, the program's focus is to initiate, support and coordinate community-based river monitoring, assessment and improvement programs in regional watersheds throughout the basin. Through the new program, CRWP continues to put water quality and physical survey information into the hands of local communities, and support efforts to use that information to direct river and other watershed protection and improvement efforts.



Current project areas include the Mattabeset/Coginchaug, Hockanum, Eightmile, Salmon and Pequabuck River watersheds.

<sup>1</sup> Additional information about the surveys, including data summaries, can be found in the *Hockanum River Stream Walk Summary Report*, published by the Middlesex County Soil and Water Conservation District in May 2000, and *Tankerhoosen River Stream Walk Summary Report*, published by the Middlesex County Soil and Water Conservation District in September 2001.

## PROJECT SUMMARY

### Goals

The Hockanum River Rapid Bioassessment was undertaken as part of an ongoing community-based effort to document the health of the Hockanum River watershed. Based on input from the Hockanum River Watershed Association and the Hockanum River Linear Park Committee, it was decided that a rapid bioassessment of both the Hockanum and Tankerhoosen Rivers would be the focus of this third year's effort. The overall goals include:

- ◆ Develop a baseline of information about the condition of the Hockanum River and tributaries
- ◆ Identify areas of concern and potential pollution problems that can be used to plan conservation and improvement efforts
- ◆ Raise public interest in and knowledge of the Hockanum River, both about the resources it has to offer and the problems it faces
- ◆ Develop public awareness of water quality issues and human impacts on our rivers
- ◆ Build on the existing local constituency for the Hockanum River and expand the base of active volunteers
- ◆ Form the basis for more complex water quality monitoring activities that can be pursued in future years according to needs, level of interest, ability to commit time, and the availability of other resources

### Study Design and Methodology

The DEP's Rapid Bioassessment in Wadeable Streams and Rivers by Volunteer Monitors (RBV) is a benthic macroinvertebrate assessment protocol designed specifically for volunteer programs. Benthic macroinvertebrates are bottom dwelling aquatic organisms that can be seen with the unaided eye, such as stonefly, mayfly and caddisfly nymphs. They are good indicators of water quality for several reasons: many are sensitive to pollution, the composition of the community is a good reflection of long-term water quality (since they live there year-round), they cannot easily escape pollution, and they are relatively easy to collect. In addition, there are many established methods for using macroinvertebrate data to assess water quality and stream health. Benthic macroinvertebrates are collected from shallow riffle areas by disturbing the stream bottom and catching the dislodged organisms in a net. The DEP uses the riffle-dwelling benthic macroinvertebrate community as the primary indicator of biological integrity of freshwater streams.

The RBV protocol is designed to help identify streams with pollution sensitive benthic macroinvertebrate communities. It is not a definitive assessment procedure; data are used primarily for screening purposes, to identify streams with either very high or very poor water quality. There are twenty-six organisms included in the RBV protocol (see list, Attachment A). They are easily identified due to their distinct shape, structure, color, or behavior. Each also provides key ecological information about the stream environment. RBV organisms are categorized in one of three groups:

- ◆ *Most Wanted* – The most sensitive to pollution, requiring a narrow range of environmental conditions. When abundant they are a sign of a non-impaired stream;
- ◆ *Moderately Wanted* – Less sensitive to pollution and found in a variety of water quality conditions. When abundant, more information is needed about upstream conditions to infer water quality;

- ◆ *Least Wanted* – Least sensitive to pollution and tolerant of the widest range of conditions. When they make up the majority of a sample, they indicate some level of water quality impairment.

RBVs are generally scheduled to take place in the fall, during October and November, to document the condition of the macroinvertebrate community following the summer, a “high stress” time for streams due to low flows and higher water temperatures.

Volunteers receive training in the RBV protocol in an indoor training session prior to conducting the assessment. Sampling and analysis equipment and supplies, as well as reference materials to aid in identification of organisms, are provided by the DEP. Benthic macroinvertebrates are collected using a large flat-bottom net 12” high X 18” wide with a mesh size no larger than a #30 sieve (0.59 mm). Volunteers collect three replicate samples, each consisting of two one square meter collections or “kicks”, sort and identify the organisms in the field, and document relative abundance of key organisms on official field data sheets for the RBV protocol (see Attachment B). Volunteers also keep a representative voucher collection consisting of at least one of each type of organism found, preserved in 91% isopropyl alcohol. The voucher collection is returned to the DEP along with the data sheets.<sup>2</sup>

Six sites were included in the study (see site map, Attachment C). Sites were selected to provide an upstream-downstream assessment of the Hockanum River, and a more in-depth assessment of the Tankerhoosen. As indicated in the table below, several of the sites are also DEP monitoring sites, last sampled as part of the 1998-1999 Connecticut River basin survey.

**Table 1.** Hockanum and Tankerhoosen River RBV Sites. Sites are listed upstream to downstream by river.

Site #	River	Location	Rationale
HR2 (DEP)	Hockanum R.	Lower Butcher Road in Ellington (upstream)	Upstream site; upstream of Vernon STP
HR9a	Hockanum R. <sup>3</sup>	Behind Adams Mill Restaurant in Manchester	Downstream site; integrator site for point and nonpoint sources
HR7b	Tankerhoosen R.	Bolton Road in Vernon (downstream)	Upstream site; control site for watershed
HR7a (DEP)	Tankerhoosen R.	Tunnel Road in Vernon (upstream)	Mid-stream site; downstream of agriculture
HR7c	Tankerhoosen R.	Downstream of Dobsonville Pond in Vernon	Impacts of pond, geese
HR7 (DEP)	Tankerhoosen R.	Golfland, near confluence with Hockanum R. (100 meters upstream)	Downstream site; integrator site for nonpoint sources

<sup>2</sup> DEP website: <http://dep.state.ct.us/wtr/volunmon/volopp.htm>

<sup>3</sup> This downstream Hockanum River was assessed by a group of high school teachers as part of a training workshop sponsored by Manchester Community College and led by Mike Beauchene, DEP Volunteer Monitoring Coordinator, the week before we conducted our survey. We eliminated the site originally chosen as a downstream Hockanum site in order to focus our resources on the Tankerhoosen.

## Volunteer Recruitment, Training and Participation

A recruitment flyer was sent to all Hockanum and Tankerhoosen River stream walk volunteers, and Hockanum River Watershed Association and Linear Park Committee members. Notices were also sent to the local newspapers. Twenty people attended the training session, held on September 28, 2002 at the Tolland Agricultural Center in Vernon. The agenda included an introduction to the Connecticut River Watch Program and Hockanum River Study, presented by the Connecticut River Watch Program Director; an introduction to local Hockanum River protection and improvement efforts, presented by the Hockanum River Watershed Association; and a training program on the DEP RBV protocol, presented by the Connecticut Department of Environmental Protection Volunteer Monitoring Coordinator.

Following the indoor training session, volunteers were grouped into four teams and assigned a specific river site. Each team was provided with sampling and analysis equipment and supplies: a kicknet, gloves, white plastic trays, forceps, hand lenses, ice cube trays (for sorting), field identification cards, a data sheet, and a vial filled with 91% isopropyl alcohol for the voucher collection. Maps were also provided showing the location of each sample site. Volunteers were also requested to complete a site sheet to document stream habitat characteristics, including river bottom composition, water depth and width, current velocity, and stream shading (not part of the RBV protocol).

Teams proceeded to their sites to complete their fieldwork. They first identified three different locations in the riffle where samples would be collected, then collected, sorted and identified organisms from each of the three samples. Relative abundance of each RBV organism was recorded on the RBV data sheet, and at least one of each type of organism found was placed in the vial filled with alcohol for the voucher collection. The DEP Volunteer Monitoring Coordinator and CRWP Director circulated between the sites to assist the volunteer teams.

After completing their fieldwork, volunteers reconvened at the Tolland Agricultural Center to turn in their data sheets, voucher collections, and equipment and supplies.



Volunteers collect a sample from the riffle



Volunteers pick and sort organisms from a sample



Volunteers record data



## SURVEY RESULTS

RBV data sheets were reviewed and voucher collections examined by the DEP Volunteer Monitoring Coordinator. A list of all organisms included on the data sheets and in the voucher collection was generated for each sample site, and an overall assessment of the health of the river made based on the data collected. Rapid bioassessment results are summarized in a table format (Attachment D). The table includes information about RBV organisms, as well as additional organisms that were included in the voucher collections.

The RBV data show good representation among organisms from all categories (*most wanted, moderately wanted, and least wanted*), with two exceptions. No organisms in the *most wanted* category were found at the Adams Mill Restaurant site on the Hockanum, and no organisms from the *least wanted* category were found at the upstream Tankerhoosen River site. Results for both rivers indicate an upstream-downstream decline in water quality, seen in the decreasing numbers of *most wanted* organisms found. As seen in Table 2 below, the best representation of *most wanted* organisms was found at the two upstream Tankerhoosen sites, with 50% and 47% of the organisms in the *most wanted* category, indicating better conditions at these sites. Moving downstream on the Tankerhoosen, 20% and 15% of the organisms found were in the *most wanted* category, indicating potential impacts at these sites. Again in the Hockanum River, 30% of the organisms found at the upstream site were in the *most wanted* category, while 0 were found at the downstream Manchester site. *Moderately wanted* organisms were the most commonly collected organisms.

**Table 2.** Occurrence of different types of organisms within each RBV category by site (listed upstream to downstream by river). Higher representation of organisms in the *most wanted* category—the most sensitive to pollution—is an indicator of better water quality.

Site #	River	Location	Most	Moderate	Least	Total #
HR2	Hockanum R.	Lower Butcher Road in Ellington	30% (3)	40% (4)	30% (3)	10
HR9a	Hockanum R.	Behind Adams Mill Restaurant in Manchester	--	50% (4)	50% (4)	8
HR7b	Tankerhoosen R.	Bolton Road in Vernon	50% (6)	50% (6)	--	12
HR7a	Tankerhoosen R.	Tunnel Road in Vernon	47% (8)	29% (5)	24% (4)	17
HR7c	Tankerhoosen R.	Downstream of Dobsonville Pond in Vernon	20% (2)	60% (6)	20% (2)	10
HR7	Tankerhoosen R.	Golfland, near confluence with Hockanum R.	15% (2)	46% (6)	39% (5)	13

The most commonly collected organisms (found in at least four of the six sites) were:

- ◆ Perlidae (Panel 5 – Common Stonefly – Most);
- ◆ Plecoptera (Panel 5 – Miscellaneous Stoneflies – Most);
- ◆ Hydropsychidae (Panel 9 – Common Netspinner Caddisfly - Moderate);
- ◆ *Chimarra* (Panel 10 – Fingernet Caddisfly – Moderate);
- ◆ *Stenonema* (Panel 11– Flat-headed Mayfly – Moderate);
- ◆ *Corydalus* (Panel 13 – Dobsonfly Larva – Moderate);
- ◆ *Nigronia* (Panel 13 – Fishfly Larva – Moderate);
- ◆ Chironomidae (Panel 15 – Midge Fly Larva – Least); and
- ◆ Oligocheata (Panel 15 – Aquatic Earth Worm – Least).

In general, streams with representation from all RBV categories indicate good water quality.<sup>4</sup> Based on the RBV organisms found, one can infer that all sites assessed have good water quality, with the exception of the downstream Hockanum River site. The lack of *most wanted* organisms—the most telling indicators due to their sensitivity to pollution and changes in habitat—indicates impaired water quality at this site. On the other hand, the abundance of *most wanted* organisms at the two upstream Tankerhoosen sites is a sign that water quality is very good.

Included in the voucher collections were seven additional (non-RBV) organisms. Five ranged in tolerance value from 3 to 5 (*moderately wanted* in RBV terms); and the remaining two had tolerance values of 6 (*least wanted* in RBV terms).

Some of the differences seen at the sites may be due in part to differences in sampling and observation techniques; future rapid bioassessments will help determine whether these differences reflect actual differences in the benthic macroinvertebrate communities.

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<sup>4</sup> Written communication from Mike Beauchene, CT DEP, November 2002.

## RECOMMENDATIONS

The information collected from the Rapid Biological Assessment provides a baseline against which we can measure future changes. While overall the results of the assessment are relatively positive, potential concerns were revealed by the data, especially at downstream locations on both rivers. These, coupled with threats to the Rivers' health identified in the stream walk surveys conducted in 1999 and 2000, point toward the need for river improvement and protection projects (some of which are underway). If these concerns and threats are not addressed in a timely way, water quality may be further affected. Continued monitoring will help to assess changes in water quality over time, and document improvements resulting from ongoing management and restoration activities.

As a follow-up to this year's monitoring effort in the Hockanum and Tankerhoosen Rivers, general recommendations include:

- ◆ Conduct a Rapid Biological Assessment on an annual basis;
- ◆ Continue the collection of baseline information by conducting physical surveys of additional streams in the watershed;
- ◆ Follow up on stream walk survey data collected, as recommended in the 1999 and 2000 stream walk summary reports;
- ◆ Conduct additional river monitoring activities to assess in-stream health, including additional benthic macroinvertebrate surveys, and analysis of water samples for chemical, physical and biological indicators of water quality;
- ◆ Monitor river segments periodically to assess conditions. This could be accomplished through a stream segment adoption program whereby volunteers make visual observations on an annual basis and file a written status report.

*For assistance and further information, please contact:*

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## ACKNOWLEDGEMENTS

The Hockanum River Rapid Bioassessment would not have been possible without the assistance of numerous volunteers and cooperating agencies. Our sincere thanks to all of the following, who have contributed to the bioassessment project.

### Volunteers

George Arthur	Courtney Kurban
Jeff and Suzanne Carlson	Ann Letendre
Ammad Chowhan	Jim Powell
Rachel DeMaio	Steven Schortman
Ed Dresner	Cole Simcic
Tim Gardiner	Doug Smith
Ginny Gengras	Sarah Smith
Julie Gross	Cory and Phil Sussler
Michael Kellogg	

### Cooperating Organizations, Businesses and Municipalities

Hockanum River Linear Park Committee – Vernon: Special thanks to *Ann Letendre*, who helped schedule the bioassessment activity, made arrangements for the training facility, publicized the event and recruited volunteers, provided local input in the study design, and participated in the assessment.

Hockanum River Watershed Association: Special thanks in particular to members *Doug Smith and George Arthur*, for their assistance in planning the biological assessment, recruiting volunteers, and performing the assessment.

Hartford County Soil and Water Conservation District: Special thanks to *Ruth Klue*, who assisted in publicizing and recruiting volunteers for the bioassessment.

Tolland County Soil and Water Conservation District: Special thanks to *David Askew and Barbara Kelly*, who assisted in planning, publicizing and recruiting volunteers for the bioassessment.

Connecticut Department of Environmental Protection: Special thanks to *Mike Beauchene*, who provided DEP input in the study design, trained volunteers, brought field equipment, assisted volunteers with the assessment work in the field, and reviewed results and performed the quality assurance checks on voucher collections.

### Funders

This project was funded in part by the Connecticut Department of Environmental Protection through a US Environmental Protection Agency Clean Water Act §319 non-point source grant.

## **Attachments**

**A – RBV Organism List**

**B – RBV Field Data Sheet**

**C – Site Map**

**D – Data Summary**

## Attachment A – RBV Organism List

### Rapid Bioassessment for Volunteers – Organism List

RBV Panel #	Genus	Family	Order	Common Name	RBV Category	Tolerance Value
1	<i>Drunella</i>	Ephemereillidae	Ephemeroptera	Body-Builder Mayfly	MOST	0
2	<i>Isonychia</i>	Isonychidae	Ephemeroptera	Minnow Mayfly		2
3	<i>Epeorus</i>	Heptageniidae	Ephemeroptera	Flat-headed Mayfly		0
4		Peltoperlidae	Plecoptera	Roach-like Stonefly		0
5		Perlidae	Plecoptera	Common Stonefly		1
5		Miscellaneous	Plecoptera	Stonefly		1
6	<i>Apatania</i>	Limnephilidae	Trichoptera	Cornucopia Case Maker		0
6	<i>Glossosoma</i>	Glossomatidae	Trichoptera	Mini-stone Case Maker		0
6	<i>Rhyacophila</i>	Rhyacophilidae	Trichoptera	Michelin-Man Caddisfly		0
8	<i>Brachycentrus</i>	Brachycentridae	Trichoptera	Mid-size Plant Case Builder		1
8	<i>Lepidostoma</i>	Lepidostomatidae	Trichoptera	Mid-size Plant Case Builder		1
9		Hydropsychidae	Trichoptera	Common Netspinner	MODERATE	4
10	<i>Chimarra</i>	Philopotamidae	Trichoptera	Fingernet Caddisfly		3
11	<i>Stenonema</i>	Heptageniidae	Ephemeroptera	Flat-headed Mayfly		4
12	<i>Psephenus</i>	Psephenidae	Coleoptera	Water Penny Beetle Larva		4
13	<i>Corydalus</i>	Corydalidae	Megaloptera	Dobsonfly Larva		6
13	<i>Nigronia</i>	Corydalidae	Megaloptera	Fishfly Larva		4
14		Aeshnidae Gomphidae Coenagrionidae	Odonata	Dragonfly, Damselfly Nymphs		3
15		Amphipod	Amphipoda	Scud	LEAST	8
15			Oligochaeta	Aquatic Earth Worm		9
15		Isopod	Isopoda	Sowbug		8
15		Simuliidae	Diptera	Black Fly Larva		6
15			Hirudinea	Leech		8
15		Chironomidae	Diptera	Midge Fly Larva		6
15			Gastropoda	Snail		7


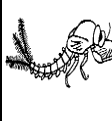

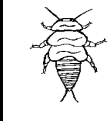


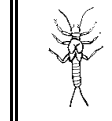
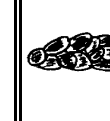


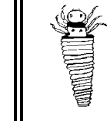

## Attachment B – RBV Field Data Sheet





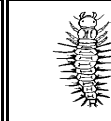
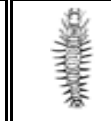
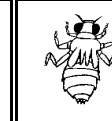
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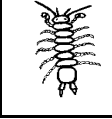


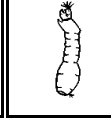
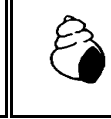
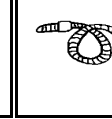
**Collection Location (up or downstream of a permanent landmark):** \_\_\_\_\_ **Town:** \_\_\_\_\_

**Approximate stream width:** \_\_\_\_\_ **Approximate stream depth:** \_\_\_\_\_ **Collectors** \_\_\_\_\_

**Comment or observation about the general condition of the stream:** \_\_\_\_\_

Panel number Name	1	2	3	4	5	5	5	6	6	7	8	8
	Drunella	Isonychia	Epeorus	Peltoperlidae	Perlidae	Pteronarcys	Stonefly	Glossosoma	Apatania	Rhyacophila	Brachycentrus	Lepidostoma
												
Kicks 1-2												
Kicks 3-4												
Kicks 5-6												
<b>Total for Site</b>												

Panel number Name	9	10	11	12	13	13	14
	Hydropsychidae	Chimarra	Stenonema	Psephenus	Corydalus	Nigronia	Odonata
							
Kicks 1-2							
Kicks 3-4							
Kicks 5-6							
<b>Total for Site</b>							

Panel number Name	15	15	15	15	15	15	15
	Amphipod	Isopod	Leech	Midge	Simuliidae	Snail	Worm
							
Kicks 1-2							
Kicks 3-4							
Kicks 5-6							
<b>Total for Site</b>							

**Instructions:**

- 1 Record few, some, or many for each of the types of organisms you collected during kicks 1&2, 3&4, 5&6, and total for the site. **FEW, SOME, & MANY are based upon the abundances of each type of organism in this sample only.**
- 2 Place 1 of each type of organism you identified into a vial containing isopropyl alcohol.
- 3 Place a pencil written label into the vial. Include, stream name, date of collection, collectors, and location of collection.
- 4 Submit the vial and datasheet to:

Mike Beauchene  
 (860) 424-4185  
 mike.beauchene@po.state.ct.us



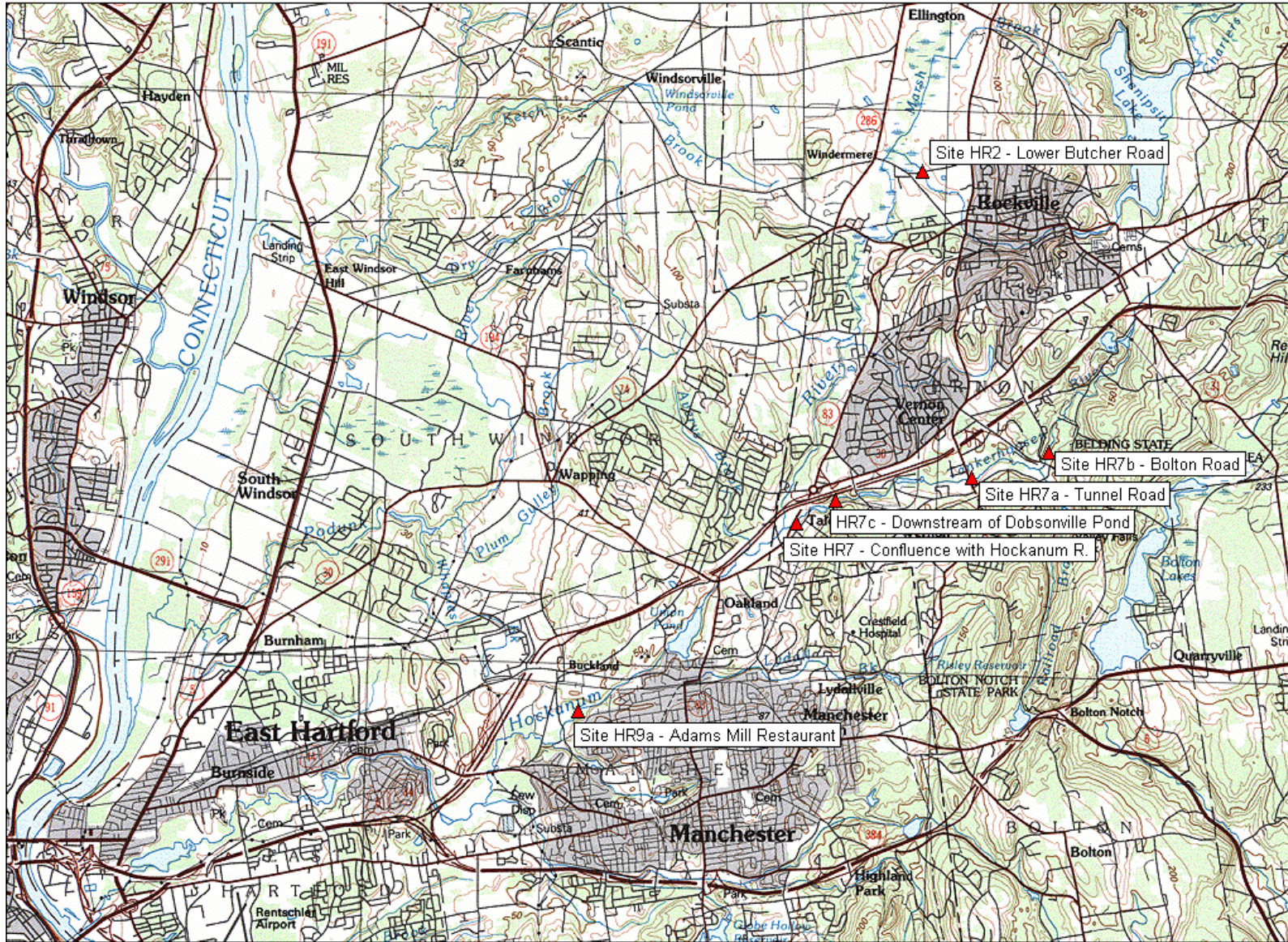
Most Wanted

Moderately Wanted

Least Wanted

# Attachment C – Site Map

## Hockanum/Tankerhoosen River Rapid Bioassessment Sites



MN TN  
15°

0 1 2 3 4 miles  
0 1 2 3 4 5 6 7 km  
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**Attachment D – Hockanum River Rapid Bioassessment – Summary of Organism Data from 9/28/02**

(X indicates found in voucher collection but not recorded on data sheet)

RBV Panel #	Genus	Family	Order/Class	Common name	RBV Category	Tolerance Value	Hockanum River		Tankerhoosen River			
							Lower Butcher Rd, Ellington	Adams Mill Restaurant, Manchester	Bolton Rd, Vernon	Tunnel Rd, Vernon	Downstream of Dobsonville Pond, Vernon	At mouth (Golfand), Vernon
1	<i>Drunella</i>	Ephemerellidae	Ephemeroptera	Body Builder Mayfly	MOST WANTED	1			few	X		
2	<i>Isonychia</i>	Isonychidae	Ephemeroptera	Minnow Mayfly		2				X		few
3	<i>Epeorus</i>	Heptageniidae	Ephemeroptera	Two-tailed Flat-head Mayfly		0	few		few	some		
5		Perlidae	Plecoptera	Common Stonefly		1			many	many	few	few
5	<i>Pteronarcys</i>	Pteronarcyidae	Plecoptera	Giant Stonefly		0				many		
5			Plecoptera	Miscellaneous Stoneflies		1	few		some	few	some	
6	<i>Glossosoma</i>	Glossomatidae	Trichoptera	Mini-stone Casemakers		0	few			few		
7	<i>Ryacophila</i>	Ryacophilidae	Trichoptera	Michelin-man Caddisfly		0			some	X		
8	<i>Lepidostoma</i>	Lepidostomatidae	Trichoptera	Mid-size Plant Case Builders		1			few			
9		Hydropsychidae	Trichoptera	Common Netspinner	MODERATELY WANTED	4	many	many	X		many	many
10	<i>Chimarra</i>	Philopotamidae	Trichoptera	Fingernet Caddisfly		3	few	few	some	X	few	many
11	<i>Stenonema</i>	Heptageniidae	Ephemeroptera	Flat-head Mayfly		4	some	some	some	few	few	few
12	<i>Psephenus</i>	Psephenidae	Coleoptera	Water Penny Beetle Larva		4				some	few	few
13	<i>Corydalus</i>	Corydalidae	Megaloptera	Dobsonfly Larva		6		few	some		some	few
13	<i>Nigronia</i>	Corydalidae	Megaloptera	Fishfly Larva		4			some	few	X	X
14		Aeshnidae Gomphidae Coenagrionidae	Odonata	Dragonfly, Damselfly Nymphs		3 <sup>1</sup>	some		few (Aeshnidae)	few (Gomphidae)		
15			Amphipoda	Scud	LEAST WANTED	8						many
15			Isopoda	Aquatic Sowbug		8	few					few
15			Hirudinea	Leech		8		some				few
15		<i>Chironomidae</i>	Diptera	Midge Fly Larva		6	some	some		many	X	
15		<i>Simulidae</i>	Diptera	Black Fly Larva		6		some		some		few
15			Gastropoda	Snail		7				few		
15			Oligochaeta	Aquatic Earth Worm		9	few	some		few	few	X

<sup>1</sup> The RBV protocol assigns these organisms an overall tolerance value of 3. The families found have the following tolerance values: Aeshnidae, 3; Gomphidae, 1; Coenagrionidae, 9.

Additional Organisms In Voucher Collection (not on RBV list)

RBV Panel #	Genus	Family	Order	Common name	RBV Category	Tolerance Value	Hockanum River		Tankerhoosen River			
							Lower Butcher Rd, Ellington	Adams Mill Restaurant, Manchester	Bolton Rd, Vernon	Tunnel Rd, Vernon	Downstream of Dobsonville Pond, Vernon	At mouth (Golfland), Vernon
--	<i>Antocha</i>	Tipulidae	Diptera	Crane Fly Larva	NA	3	X					
--	<i>Tipula</i>	Tipulidae	Diptera	Crane Fly Larva		4	X			X		X
--		Limnephilidae	Trichoptera	Northern Casemaker		4				X		
--		Baetidae	Ephemeroptera	Small Minnow Mayfly Larva		4		X				X
--	<i>Calopteryx</i>	Calypterygidae	Odonata	Damselfly Nymph (Broadwing)		5	X					
--		Polycentropodidae	Trichoptera	Trumpetnet & Tube-making Caddisflies		6	X				X	
--			Decapoda	Crayfish		6	X	X				X