

# **Housatonic River Water Quality Report East Branch 2001 – 2003**



The East Branch seen from the Old Mill Trail in Dalton, MA.



# Housatonic River Water Quality Report, East Branch 2001 - 2003

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And the hard labor of many, caring volunteers!  
(Please see page 16 for a list of our water quality monitors.)



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## **I. OVERVIEW**

The shoreline survey information collected by the East Branch Stream Team volunteers in 1999 provided preliminary information about this section of river and its watershed. These surveys described the general characteristics of the river and surrounding land use, identified potential areas of negative impacts, and provided a basic overview of the health of the watershed.

We used this information to develop our water quality monitoring program, which we have continued each year since 2001. The data results from month to month and year to year have varied, but they have pointed out areas where there may be some human-caused sources of pollution. Even three years' worth of sampling does not provide concrete data to fully pinpoint causes of water quality impairments, but it is helping us to narrow down the sources.

## **II. INTRODUCTION**

HVA started monitoring eleven sites on the East Branch of the Housatonic River in April, 2001. Some of those sites are still being monitored today, but some have been discontinued, while still others have been added. Sixteen sites were monitored in 2002. Twelve sites were monitored in 2003.

Original speculation that the lakes and ponds in the watershed might be contributing higher levels of phosphorus, nitrogen or bacteria to the river, due to residential development along their shores, has proven to be unfounded. The only impact the lakes seem to have on the river environment is due to the varying flow level, which can be so low that it no longer provides sufficient flow for aquatic organisms. Also, the water temperatures coming out of the impoundments are frequently too high for the organisms that should be able to live there. These "lake sites", Bennett Brook, Frisell Brook, and Center Pond, were monitored in 2001 and 2002 and then discontinued.

Bullard's Crossing is our site closest to the headwaters and it was chosen to act as a reference site since it is located in the Hinsdale Flats Area of Critical Environmental Concern. We believed this pristine location would provide us with excellent water quality against which we could compare our other sites farther down in the watershed. We found, however, that although this location is not impacted by human development, the beaver population in the area is thriving, and having its own impact on the water quality in the river! This site was monitored in 2001 and 2002 but then discontinued due to sporadic high bacteria levels. Water quality in the Wahconah Falls State Park has proven to be consistently good so we now use it as our reference site instead of Bullard's Crossing.

Starting in April and continuing through October 2003, HVA sampled twelve sites on the East Branch of the Housatonic River. This report primarily summarizes the all data we have collected on the sites that we monitored in 2003, whether we have monitored those sites for two years or all three years. Data tables for the sites dropped after the first two years is also included in Appendix B.

Samples are collected monthly for Fecal Coliform bacteria, E-Coli bacteria, Total Phosphorus, Nitrate-Nitrogen, and Total Suspended Solids. These samples are taken to Berkshire Enviro-Labs

(BEL) for analysis. Dissolved oxygen is also measured monthly, but the samples are analyzed at HVA's lab. Water and air temperatures are measured at most of the sites, by the field volunteers. Some sites were added in 2002 to help locate sources of bacteria and nutrients, so only those parameters are measured at those sites. All parameters are analyzed by Berkshire Enviro-Labs except for dissolved oxygen and, of course, the temperatures.

pH and alkalinity are sampled in the spring and the fall, instead of monthly like the other parameters. Previous years' data showed that the pH levels have been staying within their state standards, and although there is no state standard for alkalinity, it is lower in the tributaries in early spring. These samples are also analyzed at Berkshire Enviro-Labs.

This data is providing valuable information about the condition of the Housatonic River and the impacts we are having upon it. Since we sample on only one day per month, it is important that we sample over an extended period of time to be able to see if any trends are forming. One day's bad results, or one day's good results, do not provide enough information to draw any accurate conclusions about the health of the river at that location. Water quality can vary from hour to hour and day to day.

### **III. PROJECT DESCRIPTION**

In 1999 volunteers carried out shoreline surveys of the East Branch of the Housatonic River, starting at Muddy Pond, in Washington and continuing through Hinsdale and Dalton to the town line with Pittsfield. Some of the questions and concerns that arose from the surveys revolved around the possible impacts on the river from land use activities in the watershed, such as the golf courses, farming operations, developed areas, and other human activities. Also in question is whether the water in the lakes and reservoirs has any impact on the river, due to decreased oxygen or elevated temperatures and/or nutrients in the impounded water.

Therefore, our initial sites were chosen above and below a major golf course, above and below some farmland, and below the major lakes/reservoirs. Two sites were also chosen that we thought would represent fairly pristine areas, since they are in the headwaters of the watershed (Bullard's Crossing and Wahconah Falls State Park). These sites were to act as reference sites for the other more developed areas of the watershed. The site farthest downstream is across from the USGS gauging station just below Hubbard Ave. in Pittsfield. This site represents the water quality in the river after it leaves the town of Dalton and enters Pittsfield.

#### **What We Tested:**

We test the river for nine basic parameters that measure the health of a river: dissolved oxygen, temperature, pH, alkalinity, nutrients (total phosphorus and nitrate-nitrogen), total suspended solids, E-coli and fecal coliform bacteria. The following information was summarized from the EPA's Volunteer Monitoring Manual.

1) Dissolved Oxygen: Waters that are consistently high in dissolved oxygen are considered to be healthier since they can support many different kinds of aquatic organisms, even those, like trout, that require high amounts of oxygen. Massachusetts' state standards require at least 6 mg/l of oxygen for cold water fisheries, and 5 mg/l for warm water fisheries. Hubbard Ave. is the only site HVA monitors in the East Branch that is classified as a warm water fishery.

2) Water Temperature: Temperature affects the rates of many biological and chemical processes. Every organism has an optimum temperature at which its growth and reproduction occurs most efficiently. Colder water can also hold more oxygen. Massachusetts' state standards require the cold water fisheries in the East Branch to remain below 20 degrees Celsius. Warm water fisheries, including the site at Hubbard Avenue, must not exceed 28.3° C.

3) pH: Measures the concentration of hydrogen ions in a water sample. pH levels can be affected by the surrounding bedrock, by rain and snow deposition from burning fossil fuels, and/or by wastewater discharges. Massachusetts' state standards require the pH remain between 6.5 and 8.3.

4) Alkalinity, or Acid Neutralizing Capacity (ANC): The alkalinity of a river is a measurement of the water's ability to neutralize acids. This shows us how vulnerable the river is to acid rain. Alkalinity is strongly affected by the surrounding bedrock. There are no state standards for alkalinity, but according to the Massachusetts Acid Rain Monitoring Project, if the levels are below 20 mg/l, then that water is considered to be susceptible to acid rain.

5) Total Phosphorus and Nitrate-Nitrogen: These two plant nutrients are both found naturally in the environment, but high levels can also indicate inputs resulting from human activities. High levels of these nutrients can lead to excessive plant growth, which causes an imbalance in the ecosystem, and can impair human recreation in those waters. High levels of phosphorus and nitrogen can be caused by fertilizers. High levels of nitrogen can also indicate insufficient treatment of wastes from septic systems or wastewater treatment plants. There are no state standards for either of these two nutrients, but high levels of nitrates during times of low stream flow are especially indicative of potential pollution sources.

6) Fecal Coliform bacteria and E-Coli bacteria: Fecal coliform and E-Coli bacteria are two kinds of bacteria found in the waste from warm-blooded animals. The presence of E-Coli bacteria correlates to how human health might be affected by swimming in water with this kind of bacteria in it. Potential sources are failing septic systems, wastewater treatment plants, runoff, or animal manure. Massachusetts' state standards require that for safe swimming, known as "primary contact", the fecal coliform bacteria levels must remain below ("the geometric mean of") 200 colonies per 100ml of water. For safe "secondary contact" (i.e. fishing or boating) the levels need to remain below 1000 colonies per 100 ml sample.

7) Total Suspended Solids (TSS): "Total Suspended Solids" refers to the silt and clay particles, plankton, algae, fine organic debris and other particles suspended in the water that are larger than 2-microns in size. High amounts of solids in the water affect water clarity, decreasing the amount of light that can pass through the water, thereby slowing photosynthesis by aquatic plants. Photosynthesis produces oxygen,

so more suspended solids in the water results in less oxygen available for aquatic plants and animals. Suspended solids can also carry certain toxins that cling to those particles. Water will heat up more rapidly, and hold more heat, when it has higher amounts of solids. This can cause problems for those species, like trout, that require lower temperatures and higher amounts of oxygen. Sources of solids include wastewater discharges, road runoff and soil erosion. State standards do not require specific numerical levels.

### **Where and When We Tested in 2003:**

From April through October of 2003, the sites described below were monitored on the second Tuesday of each month. Some of these sites were monitored in 2001 and 2002 as well. For more details about each of these first two years, please see the water quality reports from 2001 and 2002. CDs with both years' reports are available from the HVA office in South Lee, MA.

### **2003 Sampling Site Locations:**

See Appendix A for a map showing our monitoring sites on the East Branch.

“**Home Club**” is our first site at the top of the watershed, located just upstream from the downtown area of Hinsdale. This site was added in 2002.

“**Metal Bridge**” refers to the green metal bridge behind the Mobil gas station in downtown Hinsdale.

“**Carmel House**” is located between Metal Bridge and Partridgefield, just downstream from where Route 8 crosses the river in Hinsdale. This site was added in 2002.

“**Partridgefield**” is a store on the downstream edge of Hinsdale. This site is at the upstream corner of their property.

“**High School**” refers to the bridge near Wahconah Regional High School in Dalton. This site is just upstream from the golf course.

“**Orchard Road**” in Dalton is just downstream from the golf course. It is also just downstream from where Cleveland Brook joins the East Branch.

“**State Park**” refers to Wahconah Falls State Park. We take our samples just downstream from Windsor Reservoir, by an old stone foundation, upstream from the falls.

“**Cleveland Road**” is shortly downstream from the state park, and upstream from the WFB at Rt. 9 site. This site was added in 2002.

“**WFB at Rt. 9**” is where Wahconah Falls Brook crosses Route 9 in Dalton, *just* upstream from Center Pond, and downstream from Cleveland Rd. and some farms and houses.

“**High Street**” is on Walker Brook, just as the brook enters the culvert at High Street. The brook passes through a residential neighborhood in this culvert before day-lighting again by the post office on Route 9. This site was added in 2002.

“**Walker Brook Outflow (Confluence)**”. After exiting from the culvert by the post office, the brook flows a short distance before joining the East Branch by the River Run Apartments. This site was added in 2002.

“**Hubbard Avenue**” is in Pittsfield, but just downstream from the Dalton town line. We take our samples between Hubbard Avenue and the USGS' Coltsville gauging station.

### **Quality Assurance Procedures:**

HVA wrote a Quality Assurance Project Plan (QAPP) to describe how we collect, transport, and analyze our samples. This is an important component of a monitoring program since it ensures that the results were obtained using standard, approved procedures. This river monitoring QAPP has been approved by the DEP and EPA.

In order to be sure that our results were reliable, at least 10% of the samples we take are quality control samples. Duplicate samples, and/or blank samples and/or split samples are taken every month to be sure our results were falling within an acceptable range of accuracy.

We also participate in the quality control program from the lab at the University of Massachusetts Amherst. Each month they send us samples that have fixed levels of dissolved oxygen. We then analyze those samples in our lab at HVA to see whether our results fall within an acceptable range, which, happily, they always have (if a piece of equipment does not produce acceptable results, it will not be used for analyzing samples that day). Results are in Appendix D.

## **IV. OUR SITES AND THEIR WATER QUALITY RESULTS**

Below are descriptions of the sites we monitored in 2003, along with a summary of all the water quality results from each site. Some sites have data from 2001, 2002, and 2003. Some sites only have data from 2002 and 2003. Please see Appendix B for the actual data tables. CDs are available for those who want to see all the tables *and* graphs of data from the last three years.

**Home Club:** Monitored in 2002 and 2003 by Lynn Roberson and HVA staff.

**Description:** “Home Club” is the first site you would encounter if you were to float into the town of Hinsdale from the headwaters of the East Branch of the Housatonic River. This site acts as an upstream reference site, measuring the water quality as the river leaves the “Hinsdale Flats’ Area of Critical Environmental Concern” (ACEC) and enters the downtown section of Hinsdale.

Home Club was not monitored in 2001, the first year HVA monitored the river. Home Club was added in 2002 because in 2001 HVA’s water quality monitoring volunteers found high bacteria levels at two sites just downstream from the Home Club (“Metal Bridge” and “Partridgefield”).

Bacteria levels at Home Club remained below state standards for safe swimming in 2002 except in May, ‘02 when it went up to 990 colonies. This occurred during the only substantial rain event that fell on one of our seven monitoring days in 2002. In 2003, Home Club had high enough bacteria levels in August (fecal coliform bacteria reached 1,200 colonies per 100 ml) to make it unsafe for even secondary contact (fishing or boating). In September ‘03, it was 340 colonies, which is safe for secondary contact (i.e. boating), but it exceeded the 200 colony level required to be safe for primary contact (i.e. swimming).

Levels of nitrates, alkalinity, pH, and phosphorus appear to stay within acceptable levels.

Levels of total suspended solids jump up sometimes, in particular during rain events.

Water temperatures reached or exceeded the state designated standards on 3 of the 6 days we monitored temperature in the summer of 2002. The water reaching this site has been exposed to the sun as it winds through the open and flat area of the Hinsdale Flats.

Conclusions: We recommend continued monitoring at this site since it tests the water quality of the river before being impacted by the downtown section of Hinsdale. Except for warm summer temperatures, and occasional spikes in bacteria and total suspended solids due to rain events, the water quality appears quite healthy.

**Metal Bridge:** Monitored in 2001 and 2002 by Holly Adams, and in 2003 by Mike Frederick.

Description: This site is located in downtown Hinsdale, just upstream from the Renfrew Mill dam. The slow flow in this area, and upstream from here in the Hinsdale Flats, appears to result in lower oxygen levels (due to a lack of rapids and mixing), higher temperatures (due to more time exposed to the sun), and higher bacteria levels (due to more time for the bacteria to multiply in stagnant spots).

Metal Bridge had fecal coliform levels that exceeded state standards for safe swimming for more than half of the sampling days in 2001 and 2002. Fecal bacteria levels in July, August and September 2003 were too high for swimming but were safe for fishing.

In all three years, the levels of dissolved oxygen were often too low to meet the state standard of 6 mg/l for a cold water fishery.

In 2001 and 2002, the water temperature was above state standards in the summer months. In 2003, water temperatures were too high in July and August to meet its classification as a cold water fishery.

Conclusion: The water quality at this site, with its low oxygen, high temperatures, and occasional high bacteria, may be mostly due to the slow flow in this stretch of the river (it is located just upstream from a dam that backs up the water). Upstream from here, in the Hinsdale Flats, the water is also frequently warm, with low oxygen, and occasional high bacteria levels. We do not recommend continued monitoring of this site in 2004 since the water quality problems seem to be due to the quality of the water flowing into town from the Flats, and due to the slowed flow due to the dam. Although the residential area upstream from the Metal Bridge may be having a negative impact on the water quality in the river, we believe the next site downstream will better reflect water quality impacts from the surrounding land uses (primarily residential).

**Carmel House:** Monitored in 2002 by Lynn Roberson and in 2003 by HVA staff.

Description: The next site downstream from Metal Bridge is the “Carmel House” site. This site was added in 2002 to help find the source of bacteria and nitrates found periodically downstream at the Partridgefield site. Only bacteria, nutrients, and suspended sediments were tested at this site in 2003 since those are the indicators we are concerned about in this area.



Fecal coliform bacterial levels were too high for the state standard for safe swimming in April, May, and August of 2002. In 2003, bacteria levels at Carmel House tended to be lower than just upstream at the Metal Bridge site. On two occasions in 2003 the bacteria levels exceeded the safe swimming standard, but they were both well beneath the levels required for safe fishing and boating.

In general, nutrient levels at Carmel House are similar to the sites upstream from it.

Levels of total suspended solids were usually slightly lower here than upstream at Metal Bridge.

Water temperatures also exceeded state standards three times in 2002, but were not tested in 2003.

Conclusion: Water quality at this site fluctuates, but has yet to show any distinct problems or trends. In general it tends to be similar to the site upstream from it, Metal Bridge, though perhaps a bit higher in nitrates in dry weather. Nitrate levels, in dry months, are definitely lower here than at the next site downstream, Partridgefield. We will definitely continue monitoring this site as we search for the source of nitrates in this area.

**Partridgefield:** Monitored in 2001 and 2002 by Holly Adams, and in 2003 by Ed and Mary Jo Barrett.

Description: This last site in Hinsdale is located just upstream from the Partridgefield store. It is located in a primarily residential area, just downstream from two tributaries, and a golf course.

Fecal coliform bacteria were usually lower here than at Metal Bridge in 2001, except in July and August, and safe swimming levels were exceeded on 4 of the 7 days that it was tested in 2001. In 2002, the bacteria levels stayed below the state standard for secondary contact except in May when it reached 1,870 colonies. Bacteria levels were too high for primary contact (swimming) in May, July, and August of '02. In 2003, once again we saw high levels of bacteria in August, when three inches of rain fell on the two days preceding the sampling day. In September 2003, the fecal coliform bacteria reached 200 colonies, making it unsafe for swimming, but most of the year it appeared safe for primary contact (at least on the days that we sampled).

Nitrate levels in July of '01 and '02 were also higher than in the preceding months, and significantly higher than at the next site upstream (Carmel House). In 2003 this pattern occurred again, with the nitrate-nitrogen level jumping from 0.06 mg/l in June to 0.39 mg/l in July, both considered "dry" sampling days.

Water temperature exceeded safe levels for cold water fish in July and August, 2003, but remained below 20°C in 2001 and 2002.

The total suspended solids (TSS) skyrocketed in August 2003, a rainy day, reaching a high of 32 mg/l instead of the 1-3 mg/l that it usually is.

Phosphorous levels appear fairly low, except in 2003 when they more than doubled from July's dry weather sample to August's wet weather sample.

Conclusion: Bacteria, phosphorus and TSS reach high levels following rain events. Nitrates, however, jump during dry weather, indicating a possible sewage or fertilizer problem upstream. Additional sites need to be added upstream from here to help identify the source of nitrates.

**High School** and **Orchard Road**: Mike Darroch monitored both sites in 2001 and 2002. In 2003, Mike monitored the Orchard Road site, while Cas Makowski and Tom Doyle monitored the High School site.

Description: These sites are just upstream (High School) and downstream (Orchard Road) of a golf course and the confluence of a tributary (Cleveland Brook). They are the first sites in Dalton downstream from the town line with Hinsdale.

In 2001, both sites had high bacteria levels only once, on a day after a big rain event. For unknown reasons, in 2002 there were quite a few more occurrences of high bacteria levels (above 200 colonies per 100 ml) than there were in 2001. In 2003, bacteria levels at the High School site tended to be even higher than at Partridgefield, except in August when it had rained so heavily. Never did it exceed safe levels for secondary contact, but every month except two it was too high for safe primary contact (swimming). Bacteria levels at Orchard Road tend to be lower than at the High School site, though there is little distance between them. Perhaps this is due to some dilution occurring when Cleveland Brook enters the East Branch inside the golf course boundaries, between the High School and Orchard Road sites.

There is the substantial increase in nitrates at both these sites that occurs in July and/or August (typically a time of dry weather and low flows). Nitrates are often higher upstream at Partridgefield as well and remain high at both High School and Orchard Road. Nitrate levels also increase a bit in as the river winds its way through the golf course and is joined by Cleveland Brook. This increase may be due to nutrient sources along Cleveland Brook, or from within the golf course.

TSS levels also jumped at these two sites in August, 2003 due to the heavy rain.

Water temperatures remained below the state designated standards of 20 degrees Celsius at both sites in 2001 and 2002. In 2003, water temperature at High School (and Partridgefield) exceeded safe levels for cold water fish in July and August (at Orchard it was too high only in August).

Conclusion: The reason for the high nitrates at both these sites is probably either due to fertilizers being applied to lawns bordering the river, or due to failing septic systems nearby. It is not clear whether the higher levels at the High School are originating as far up as the Partridgefield site and being carried down to these sites, or if they are from other sources just upstream from the High School site. The slight increase in nitrate levels between the High School site and the Orchard Road site may be due to the golf course, or from a source on Cleveland Brook. The reason(s) for these increases in bacteria and nitrates is not clear, and therefore will need further

investigation to see if it is part of a pattern or not. The water quality at these two sites is usually similar enough that we may not need to monitor them both next year.

**State Park** (on Wahconah Falls Brook): Monitored by Sam and Denie Smith in 2001, Eric Witzgall in 2002 and 2003, and Holly Adams in 2003.

**Description:** This site is within the state park, below the Windsor Reservoir dam, but above the falls, by an old stone foundation. We use this site as our benchmark site against which we compare our other sites' water quality. Wahconah Falls Brook is a tributary to the East Branch and it is in a relatively undeveloped area. It is mainly forested, though there are numerous dirt roads upstream from the reservoir in the park. In general, its water quality is very good. (We originally chose Bullard's Crossing as our benchmark since it is in the very headwaters of the Housatonic River, but the population of beavers there is so pronounced there that they are having a significant negative impact on the water quality, in particular the bacteria levels, that we have now dropped that site.)

Bacteria levels never exceeded the state standard for safe swimming of 200 colonies of fecal coliform bacteria per 100 ml in 2001 or 2002. In 2003, heavy rains in August caused bacteria to rise to 410 colonies of Fecal Coliform bacteria and 390 colonies of E-coli bacteria.

Total Suspended Solids (TSS) tended to be the same or almost as high at this site than at the other two sites downstream from it on all our sampling days in 2003. High rains on August 11, 2003 washed out the dirt road along the side of the reservoir (Back Dalton Road) the day before we did our sampling. It appears that sediments in the reservoir can become suspended enough to flow out of the reservoir during large rain events.

Nitrate levels were usually well below 0.1 mg/l in 2001, 2002 and 2003, but went up to 0.16 mg/l in July of 2002 and again in July of 2003. These nitrate-nitrogen levels, sampled in dry weather conditions, are significantly higher than on most of our other sampling days.

Water Temperature has stayed below 17 degrees Celsius in all three years we have monitored here except in August, 2003, when it reached the 20 degree state standard for a cold water fishery. Perhaps this was due in part to the high amount of sediment in the water that day. Air temperatures during the 10 days prior to our sampling day were in the 70s (according to the records kept in Pittsfield at their wastewater treatment plant).

Low alkalinity is a bit of a concern every spring, but the levels do rise throughout the summer months.

The other months and parameters reflect healthy water quality conditions.

**Conclusion:** The water quality at this site is usually good, if not actually very good. We will continue to monitor it and use it as a benchmark for good water quality.

**Cleveland Road** (on Wahconah Falls Brook): Monitored in 2002 and 2003 by Kelly Marshall and her sons, Jacob and Caleb.

Description: The next site downstream from the state park is at Cleveland Road. This site was added in 2002 in an effort to pinpoint the sources of some higher levels of bacteria and nitrates found farther downstream in 2001 (at the site where Wahconah Falls Brook crosses Route 9 just before entering Center Pond). There are some houses and a trailer park upstream from this site, as well as a tractor business and farm field (though these are both well removed from the brook).

Bacteria levels were a bit too high for safe swimming in July, 2002 (380 colonies) and September (280 colonies), but were acceptable for the rest of 2002. Bacteria levels in 2003 were actually higher at State Park than at Cleveland Road in the rainy month of August, but all the other months they were higher at Cleveland than at State Park. Even so, it still only reached the fecal coliform standard for swimming twice out of seven sampling events in 2003. E-coli colonies, however, never exceeded 200 per 100ml in 2003.

Nitrate levels were higher at Cleveland Road during the drier months in 2002 than at either the State Park site upstream from it, or at the Rt. 9 site downstream from it. Like the sites both upstream and downstream from it, the nitrate levels rose in July, and stayed elevated for the rest of the 2002 sampling season. In 2003, nitrates jumped from State Park to Cleveland Road, especially in the drier months.

Total suspended solids tended to be very low (usually less than 1 mg/l) at Cleveland Road in 2003, except during the heavy rain in August when it reached 14 mg/l. It was just a little bit higher than the other two sites on Wahconah Falls Brook that day.

In 2003, there was a big jump in alkalinity from State Park (28 mg/l) to Cleveland Road (59 mg/l) on the day we tested in October. In October of 2002 there was a similar jump, from 84 mg/l at the State Park to 116mg/l at Cleveland Road.

Conclusion: The higher levels of nitrates and alkalinity here at Cleveland Road may indicate a problem with failing septic systems between this site and the State Park. Additional testing needs to be done to confirm this.

**Wahconah Falls Brook at Rt. 9:** Monitored in 2001, 2002, and 2003 by Dicken Crane.

Description: The third site on Wahconah Falls Brook is where the brook crosses under Route 9, just before entering Center Pond. Upstream from this site there are some small family farms comprised primarily of small numbers of livestock, vegetable gardens, some corn fields and pastures. The farms and homes along the brook are all on septic systems until you reach Orchard Road in Dalton.

Bacteria levels at Cleveland Road and this site, however, do not have a consistent pattern showing one site always higher than the other. In 2003, during the heavy rain in August, the levels of both kinds of bacteria were higher at State Park, and at this site, than it was at Cleveland Brook, which is the site in-between them. The fecal bacteria levels here were too high to be safe for swimming on four out of the seven days we sampled, but if you look at the E-coli

bacteria levels only, it was safe on all seven of our sampling days (E-coli levels never exceeded 235 colonies per 100 ml). In 2001, the fecal coliform levels were too high for the safe swimming standard on three of the five days we sampled. In 2002, both the fecal coliform and E-coli bacteria counts exceeded safe swimming levels on two of the seven days that we sampled.

Nitrate levels at this site, and upstream of it at the Cleveland Road site, tend to be noticeably higher than in the state park.

TSS levels in 2003 were generally very low, except for the day we sampled in August (the 12<sup>th</sup>), which was the day after a very heavy rainstorm.

Conclusion: Nitrate and bacteria levels can both be elevated at times at this site. In general, the bacteria levels rise during rain events, and the nitrate levels rise during dry weather. Alkalinity is significantly higher at this site than upstream at the State Park.

**Walker Brook's sites at High Street and its Outflow/Confluence with the East Branch:**

Both sites monitored in 2002 by Cas Makowski and Tom Doyle, and in 2003 by Carolyn Sibner.

Overall Description: Walker Brook is a tributary to the East Branch of the Housatonic River in Dalton, MA that tends to be dry for most of the year. Its headwaters are above a gravel pit and as the brook nears the gravel pit the water tends to disappear from the streambed. A short distance downstream from the gravel pit, the brook passes through a residential neighborhood. During the late 1940s or early 1950s, the brook was diverted into a culvert to pass through the residential neighborhood before day-lighting again at Rt. 9, near the Dalton Post Office. From there it flows a short distance before joining the East Branch of the Housatonic River.

HVA started monitoring this brook regularly in April, 2002 at both High Street where the brook enters the culvert, and then again downstream, just before the brook's confluence with the East Branch. There is often no flow entering the culvert or exiting it, however by the time the brook joins the East Branch there is usually a small amount of water flowing in the streambed again.

This lower section of the streambed, from the Post Office to the confluence, is made up primarily of large, flat rocks, apparently placed there as part of a channel reconstruction project. As you walk along the stream channel there is usually no water visible between the rocks until you get alongside the River Run Apartments. From there on down more and more water will gradually appear between the rocks until there is a small amount of flow just before the confluence. There are no obvious sources of this water, i.e. pipes or surface runoff. It may be that this water is the groundwater table that is surfacing in the streambed as it nears the East Branch of the Housatonic River.

Surprisingly, there seems to be a problem with the water quality in this small brook just before it joins up with the East Branch. Though there is often no flow exiting the culvert, indicating that there are probably not any illegal hookups contributing to the storm drain system, the levels of contaminants in the small brook as it joins the East Branch have often been surprisingly higher than they should be.

### **High Street**

**Description:** This brook was completely dry at this site on all the days we sampled in 2002. In 2003, there was flow here only during the spring runoff in April, and the water quality on that day did not indicate any particular problems (please see tables in Appendix B).

Phosphorous levels were higher at both sites in Walker Brook than any of the other sites in April 2003, yet they were still not so high as to indicate a problem.

**Conclusion:** What is a problem, however, is the consistent absence of water in the brook. When there is water in this brook at this site, it appears fairly healthy, but the consistent lack of water in the brook from year to year indicates something happened to cause the water to stop flowing in its streambed. This merits further investigation, since it is clearly unable to provide aquatic habitat anymore.

### **Walker Brook Outflow/Confluence:**

**Description:** In 2002, this site was too dry to sample except in May (which was a rainy day) and June. Even in these months the water flow was minimal. In 2003 we had enough flow to take at least partial samples in April, May (wet weather) and August (after three inches of rain). When the flow is too low, the jug used for collecting the nutrient and sediment samples cannot be used due to the large shoulder on the jug. The bottle used for collecting bacteria samples, however, is smaller and flatter and can still be used in lower flows.

Bacteria levels in May of 2002 (a rainy day) were very high (1,900 colonies of fecal coliform and 2,400 of E-coli). In May of 2003 (another rainy day) they were once again exceedingly high (2,000 colonies of fecal bacteria and 1,700 of E-coli) at the outflow, whereas the rest of the sites were near or below the level for safe swimming (200 colonies of fecal coliform bacteria).

The level of nitrates really differs here from all the other sites. In June of 2002, the nitrates were 1.27mg/l at this site, whereas all other sites that month didn't exceed even 0.2 mg/l. April of 2003, the outflow had 0.84 mg/l of nitrate-nitrogen in comparison to the other sites that all had either less than 0.2 or even less than 0.1mg/l. In August, 2003, the nitrate levels were at 1.45 mg/l in comparison to the other sites, none of which had even 0.1 mg/l. (Unfortunately, in July 2003 there was not enough flow to take a sample in Walker Brook, but downstream from it, at Hubbard Avenue, the nitrates were at the all-time high of 2.34 mg/l!).

TSS levels were never a problem in Walker Brook on our sampling days in 2002 or 2003.

Alkalinity appears to be much higher here in comparison to the other sites we test, including in Walker Brook itself at High Street, as well as in the East Branch directly upstream from where Walker Brook joins it. In April 2003, it was 132 mg/l whereas no other site that day exceeded 44mg/l.

pH levels were higher at the outflow than at any other site in the watershed in April 2003. Unfortunately, there was no flow here in April or October 2002 when we tested the other sites in the East Branch for pH and alkalinity.

Phosphorous levels were a bit higher at both sites in Walker Brook than any of the other sites the one time it was tested, in April 2003, yet in August 2003 when it rained, phosphorus at the outflow was as low or lower than anywhere else.

Conclusion: Nitrates are distinctly higher here than at other sites, as is alkalinity. Both these parameters can indicate a source of sewage or other pollutants. Bacteria levels are not consistently high here, however. Though there is no obvious source of these contaminants, like a pipe, there is clearly a problem occurring in this neighborhood. More water quality monitoring, plus dye testing in the surrounding sewer lines, should help pinpoint the source(s) of pollution.

**Hubbard Avenue:** Monitored since 2001 by Greg Veremko.

Description: This site is the last site in the East Branch watershed and it represents the water quality of the Housatonic River as it leaves Dalton and enters Pittsfield.

Nitrate levels in 2001 and 2002 stayed below 0.43 mg/l. In July 2003, the nitrate levels were higher than usual at all the sites, but at Hubbard for some unknown reason it was an amazingly high level of 2.34 mg/l, though they were usually below 0.2mg/l that year. They were also quite high again in October (0.42mg/l in comparison to 0.16 at Orchard Road, which is the next site upstream from there on the East Branch).

Temperatures are usually cool enough here to meet the cold water state fishery standard of 20 degrees Celsius, even though this site is classified as a warm water fishery and is not required to stay below 20° degrees Celsius. July and August are the two months when the temperature sometimes reaches or exceeds 20 degrees Celsius. Though it is not required, it is better for the cold water species of fish if it stays below 20°, and there are trout living around there that do need the cooler temperatures.

Total suspended solids were high (16 mg/l) in August '03 when it had rained so much the day before, but they are usually at or below 4 mg/l.

Alkalinity seems to jump up on occasion, like September, 2002, when it reached 200mg/l of carbonate, though alkalinity levels tend to increase as one moves farther downstream. Crane's wastewater treatment plant just upstream may be contributing to these levels in part, as is the limestone bedrock in this valley.

On every day we have tested since April, 2001, the dissolved oxygen, pH, and phosphorous levels all tend to be good, and bacteria is usually safe enough even for swimming, *except* after rain events.

Conclusions: The water quality at Hubbard Avenue is surprisingly good, considering its commercial location. The biggest issues facing this site are occasional high nitrates in drier weather, high bacteria counts after rain storms, occasional high alkalinity, as well as temperatures that are a bit too high in the summer for the trout that live there.

## **V. CONCLUSIONS AND RECOMMENDATIONS**

Even three years of testing does not tell you everything about a river's water quality and the impact human activities are having on it. There are some patterns that are showing up, however, that warrant further investigation. HVA will continue to monitor the sites that appear to have a problem, such as Partridgefield, Cleveland Brook, and Walker Brook, in order to confirm the trend, and narrow down the possible sources. Additional sites and sampling will be added as needed.

Due to funding and time constraints, we decreased the monitoring of pH, alkalinity, and phosphorus since these parameters usually did not indicate any problems for the health of the river, nor its ability to meet its state classification as a Class B Cold Water Fishery. pH and alkalinity we monitor in the spring and fall only, but we believe this will still allow us to watch for trends in these indicators. Phosphorus did not appear to indicate any problems in the river whereas other parameters did, so we will no longer monitor phosphorus after 2003.

## **VI. ACKNOWLEDGEMENTS**

We would like to thank all our major funders from these first three years of monitoring for their support, especially the Massachusetts Executive Office of Environmental Affairs (DEP), the Massachusetts Environmental Trust, the Berkshire Environmental Fund, the Wharton Trust, the Berkshire Environmental Endowment Fund and the Berkshire Taconic Community Foundation.

We also want to thank the people and organizations who have given us their help, support and wisdom over the years. These people include: Peter Kerr, Jerry Schoen and Marie-Francoise Walk at the UMassAmherst, as well as Arthur Srepetis and Peter Mitchell at DEP, John Lambert at Berkshire Community College, Holly Adams at Crane & Co., and Bill Enser at Berkshire Enviro-Labs. Thank you all for sharing your experience and expertise with us!

And last but not least, all our volunteers, many of whom have helped us since 2001! You have suffered through picayune training sessions, rainy days, cold water and cold weather, to bring us good quality data about our river. Thank you so much! We couldn't have done this without you!

Holly Adams  
MaryJo and Ed Barrett  
Dicken Crane  
Mike Darroch  
Tom Doyle  
Mike Frederick

Casimir Makowski  
Kelly, Jacob, and Caleb Marshall  
Lynne Roberson  
Sam and Denie Smith  
Gregory Veremko  
Eric Witzgall

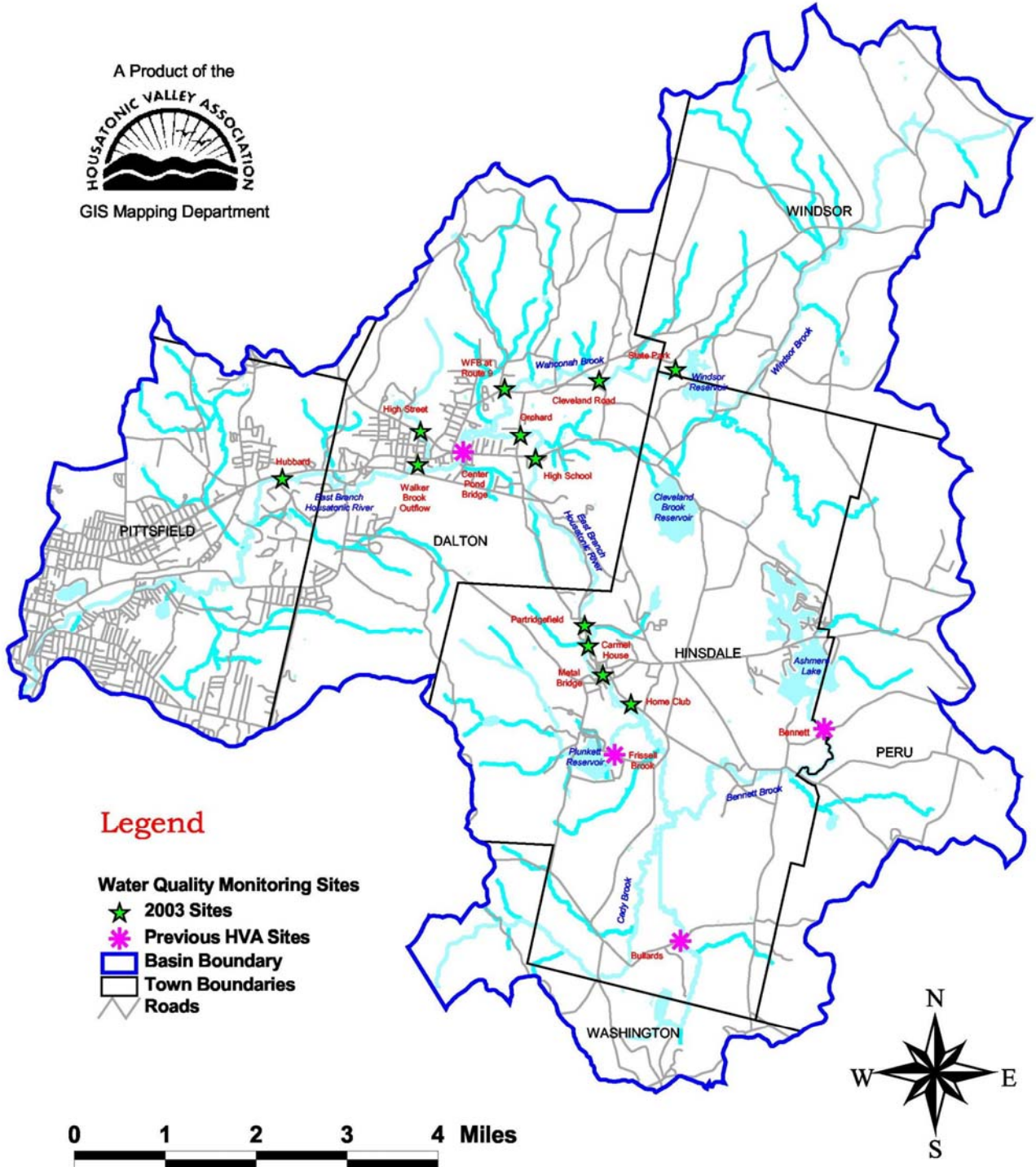
Respectfully Submitted,

Carolyn W. Sibner  
Water Quality Coordinator



Appendix A:

# Water Quality Monitoring Sites East Branch Housatonic River



**Appendix B:**

**Water Quality Monitoring Results by Site**

**East Branch of the Housatonic River**

**Site Tables from those sites monitored in 2003..... Page 19**

**Site Tables from those sites only monitored in 2001 and 2002..... Page 35**

**Weather & Notes from the Sampling Days..... Page 39**

All the Data Collected for Sites Monitored in 2003:

**2002 East Branch - Home Club**

Parameter	April '02	May '02	June '02	July '02	Aug. '02	Sept. '02	Oct. '02
Dissolved Oxygen in mg/l							
pH							7.38
Alkalinity in mg/l carbonate							68.00
Fecal Coliform in colonies/100ml **	20	990	90	110	120	50	80
E-coli in colonies/100 ml **	30	1,410	60	90	110	60	50
Total Phosphorus in mg/l *	0.010	0.02	0.040	0.040	0.020	0.050	0.030
Nitrate-Nitrogen in mg/l *	0.020	0.03	0.020	0.030	0.030	0.020	0.010
Water Temperature in degrees Celsius		7.5	17.5	21.5	22.0	20.0	10.0
Total Suspended Solids in mg/l						4	3
Turbidity in NTU							4

**2003 East Branch - Home Club**

Parameter	April '03	May '03	June '03	July '03	Aug. '03	Sept. '03	Oct. '03
Dissolved Oxygen in mg/l							
pH	7.13						7.13
Alkalinity in mg/l carbonate	28						50
Fecal Coliform in colonies/100ml **	20	120	180	160	1,200	340	130
E-Coli in colonies/100 ml **	10	120	130	110	880	290	90
Total Phosphorus in mg/l *	0.027	0.036	0.033	0.044	0.041	0.030	0.022
Nitrate-Nitrogen in mg/l*	0.040	0.03	0.02	0.03	0.02	0.02	0.02
Water Temperature in degrees Celsius	7.5						
Total Suspended Solids in mg/l ***	1	1	4	1	6	0.9	3

\* Values of "0.009" are used to graph those results below the detection limit of 0.01 mg/l.  
 \*\* Bacteria values of "9" represent those results below the detection limit of 10 colonies.  
 \*\*\* TSS values below the detection limit 1 mg/l are graphed as "0.9" mg/l.

### 2001 East Branch - Metal Bridge

PARAMETER	April '01	May '01	June '01	July '01	Aug. '01	Sept. '01	Oct. '01
DISSOLVED OXYGEN in mg/l			5.98	4.78	5.00	5.10	7.96
pH			7.02	7.36	7.56	7.60	7.46
ALKALINITY in mg/l calcium carbonate			38.3	64.4	82.1	67.4	49.8
FECAL COLIFORM in colonies/ 100 ml			230	480	180	2,500	170
NITRATE-NITROGEN in mg/l			0.05	0.08	0.06	0.010	<0.01
TOTAL PHOSPHORUS in mg/l			0.02	0.04	0.04	0.05	0.02
WATER TEMPERATURE in degrees Celsius			15.0	22.5	21.0	18.0	7.0
AIR TEMPERATURE in degrees Celsius			17.5	17.0	15.0		0.0

### 2002 East Branch - Metal Bridge

Parameter	April '02	May '02	June '02	July '02	Aug. '02	Sept. '02	Oct. '02
Dissolved Oxygen in mg/l	8.40	8.02	6.32	5.24	5.36	5.94	5.76
pH	7.17						7.17
Alkalinity in mg/l carbonate	42.0						72.00
Fecal Coliform in colonies/100ml **	20	1,500	120	410	280	140	210
E-coli in colonies/100 ml **	60	2,400	180	390	250	120	180
Total Phosphorus in mg/l *	0.020	0.04	0.030	0.050	0.040	0.040	0.030
Nitrate-Nitrogen in mg/l *	0.030	0.02	0.030	0.050	0.060	0.050	0.030
Water Temperature in degrees Celsius	9.0	7.5	18.0	22.0	21.5	18.5	11.0
Total Suspended Solids in mg/l						7	5
Turbidity in NTU							3.8

### 2003 East Branch - Metal Bridge

Parameter	April '03	May '03	June '03	July '03	Aug. '03	Sept. '03	Oct. '03
Dissolved Oxygen in mg/l	6.88	4.72	6.92	4.82	3.98	6.50	4.82
pH	7.17						7.10
Alkalinity in mg/l carbonate	30						50
Fecal Coliform in colonies/100ml **	10	150	170	280	690	310	170
E-Coli in colonies/100 ml **	10	140	150	230	560	260	130
Total Phosphorus in mg/l *	0.023	0.058	0.036	0.041	0.041	0.051	0.016
Nitrate-Nitrogen in mg/l *	0.050	0.04	0.02	0.07	0.03	0.03	0.04
Water Temperature in degrees Celsius	8.0	11.0	15.0	23.0	20.0	16.0	10.0
Total Suspended Solids in mg/l ***	1	8	4	3	12	8	3

### 2002 East Branch - Carmel House

Parameter	April '02	May '02	June '02	July '02	Aug '02	Sept '02	Oct '02
Dissolved Oxygen in mg/l							
pH							7.73
Alkalinity in mg/l carbonate							72
Fecal Coliform in colonies/100ml **	570	1,820	110	140	1,000	90	90
E-coli in colonies/100 ml **	580	1,730	110	110	930	60	90
Total Phosphorus in mg/l *	0.02	0.04	0.03	0.04	0.03	0.04	0.02
Nitrate-Nitrogen in mg/l *	0.04	0.02	0.04	0.08	0.009	0.09	0.05
Water Temperature in degrees Celsius		7.5	17.5	21.5	20.0	18.0	
Total Suspended Solids in mg/l						8	2
Turbidity in NTU							2.9

\* Values of "0.009" are used to graph those results below the detection limit of 0.01 mg/l.  
 \*\* Bacteria values of "9" represent those results below the detection limit of 10 colonies.  
 \*\*\* TSS values below the detection limit 1 mg/l are graphed as "0.9" mg/l.

### 2003 East Branch - Carmel House

Parameter	April '03	May '03	June '03	July '03	Aug. '03	Sept. '03	Oct. '03
Dissolved Oxygen in mg/l							
pH	7.46						7.62
Alkalinity in mg/l carbonate	30						50
Fecal Coliform in colonies/100ml **	10	130	80	60	380	330	60
E-Coli in colonies/100 ml **	10	100	70	60	280	270	50
Total Phosphorus in mg/l *	0.024	0.037	0.028	0.041	0.060	0.029	0.014
Nitrate-Nitrogen in mg/l *	0.060	0.04	0.03	0.12	0.03	0.03	0.04
Water Temperature in degrees Celsius	7.5						
Total Suspended Solids in mg/l ***	2.00	2	2	1	19	3	2

### 2001 East Branch - Partridgefield

PARAMETER	April '01	May '01	June '01	July '01	Aug. '01	Sept. '01	Oct. '01
DISSOLVED OXYGEN in mg/l	10.58	8.30	8.60	7.40	7.18	7.58	9.90
pH	7.25	7.78	7.66	7.91	7.93	8.01	7.76
ALKALINITY in mg/l calcium carbonate	24.4	83.4	48.9	75.0	102.0	88.2	71.6
FECAL COLIFORM in colonies/ 100 ml	110	240	160	510	240	800	50
NITRATE-NITROGEN in mg/l	0.08	0.35	0.11	0.24	0.30	0.23	0.18
TOTAL PHOSPHORUS in mg/l	<0.01	0.03	0.03	0.05	0.03	0.06	0.010
WATER TEMPERATURE in degrees Celsius	7.5	15.0	15.0	19.0	19.0	16.5	7.0
AIR TEMPERATURE in degrees Celsius	0.0	11.0	17.5	18.5	15.0	12.0	0.0

### 2002 East Branch - Partridgefield

Parameter	April '02	May '02	June '02	July '02	Aug. '02	Sept. '02	Oct. '02
Dissolved Oxygen in mg/l	9.98	10.54	8.06	7.10	7.46	7.76	8.98
pH	7.56						7.70
Alkalinity in mg/l carbonate	54.0						98.00
Fecal Coliform in colonies/100ml **	20	1,870	80	250	340	60	70
E-coli in colonies/100 ml **	40	1,990	120	230	310	20	70
Total Phosphorus in mg/l *	0.010	0.010	0.020	0.030	0.010	0.030	0.020
Nitrate-Nitrogen in mg/l *	0.090	0.03	0.010	0.280	0.530	0.390	0.240
Water Temperature in degrees Celsius	9.0	7.5	18.0	19.5	17.5	16.5	11.0
Total Suspended Solids in mg/l						8	2
Turbidity in NTU							2.7

### 2003 East Branch - Partridgefield

Parameter	April '03	May '03	June '03	July '03	Aug. '03	Sept. '03	Oct. '03
Dissolved Oxygen in mg/l	10.70	9.66	8.90	7.48	7.20	8.60	9.64
pH	7.52						7.65
Alkalinity in mg/l carbonate	36						64
Fecal Coliform in colonies/100ml **	20	140	80	80	750	200	70
E-Coli in colonies/100 ml **	10	110	40	30	610	170	60
Total Phosphorus in mg/l *	0.021	0.037	0.025	0.033	0.074	0.030	0.019
Nitrate-Nitrogen in mg/l *	0.090	0.06	0.06	0.39	0.03	0.09	0.13
Water Temperature in degrees Celsius	7.5	11.0	15.0	20.0	21.0	15.0	10.0
Total Suspended Solids in mg/l***	2	3	2	1	32	1	2

\* Values of "0.009" are used to graph those results below the detection limit of 0.01 mg/l.  
 \*\* Bacteria values of "9" represent those results below the detection limit of 10 colonies.  
 \*\*\* TSS values below the detection limit 1 mg/l are graphed as "0.9" mg/l.

### 2001 East Branch - High School

PARAMETER	April '01	May '01	June '01	July '01	Aug. '01	Sept. '01	Oct. '01
DISSOLVED OXYGEN in mg/l	11.00	8.76	9.12	8.42	7.48	7.88	10.88
pH	7.50	8.01	7.93	8.02	8.17	8.17	7.95
ALKALINITY in mg/l calcium carbonate	28.3	88.8	55.2	83.0	110.3	98.6	74.2
FECAL COLIFORM in colonies/ 100 ml	20	100	140	30	160	1,000	50
NITRATE-NITROGEN in mg/l	0.08	0.36	0.12	0.13	0.31	0.23	0.16
TOTAL PHOSPHORUS in mg/l	<0.01	0.02	0.02	0.03	0.02	0.06	0.010
WATER TEMPERATURE in degrees Celsius	7.0	14.0	14.5	17.5	18.0	16.0	5.5
AIR TEMPERATURE in degrees Celsius	5.0	11.0	15.0	13.5	18.0	11.5	-4.5

### 2002 East Branch - High School

Parameter	April '02	May '02	June '02	July '02	Aug. '02	Sept. '02	Oct. '02
Dissolved Oxygen in mg/l	10.70	bottle broken	8.68	8.04	7.78	8.28	10.02
pH	7.76						7.99
Alkalinity in mg/l carbonate	60.0						104.00
Fecal Coliform in colonies/100ml **	20	1,700	60	350	280	160	110
E-coli in colonies/100 ml **	70	1,800	50	220	250	180	70
Total Phosphorus in mg/l *	0.010	0.06	0.020	0.020	0.009	0.020	0.009
Nitrate-Nitrogen in mg/l *	0.100	0.04	0.120	0.240	0.420	0.360	0.220
Water Temperature in degrees Celsius	7.0	7.5	16.0	19.0	18.5	16.5	9.5
Total Suspended Solids in mg/l						7	1
Turbidity in NTU							1.6



### 2003 East Branch - High School

Parameter	April '03	May '03	June '03	July '03	Aug. '03	Sept. '03	Oct. '03
Dissolved Oxygen in mg/l	10.98	9.64	9.66	8.90	8.04	10.84	12.74
pH	7.66						7.84
Alkalinity in mg/l carbonate	40						76
Fecal Coliform in colonies/100ml **	20	210	140	300	650	350	200
E-Coli in colonies/100 ml **	10	180	120	220	500	210	150
Total Phosphorus in mg/l *	0.029	0.037	0.022	0.019	0.091	0.030	0.011
Nitrate-Nitrogen in mg/l *	0.110	0.08	0.009	0.32	0.009	0.100	0.12
Water Temperature in degrees Celsius	8.0	11.0	15.0	21.0	20.5	15.5	10.0
Total Suspended Solids in mg/l***	0.9	4	2	0.9	50	3	0.9

### 2001 East Branch - Orchard Road

PARAMETER	April '01	May '01	June '01	July '01	Aug '01	Sept '01	Oct '01
DISSOLVED OXYGEN in mg/l	6.22	8.32	9.04	8.16	7.20	8.20	10.48
pH	7.54	7.86	7.83	7.95	7.99	7.93	7.89
ALKALINITY in mg/l calcium carbonate	29.2	93.0	53.8	82.5	115.3	99.8	81.8
FECAL COLIFORM in colonies/ 100 ml	20	130	110	100	140	640	20
NITRATE-NITROGEN in mg/l	0.09	0.42	0.13	0.18	0.36	0.26	0.21
TOTAL PHOSPHORUS in mg/l	0.009	0.02	0.02	0.03	0.02	0.06	0.009
WATER TEMPERATURE in degrees Celsius	7.0	14.0	14.5	16.5	17.5	15.0	5.5
AIR TEMPERATURE in degrees Celsius	6.0	11.0	15.0	14.0	17.5	11.5	5.5

\* Values of "0.009" are used to graph those results below the detection limit of 0.01 mg/l.  
 \*\* Bacteria values of "9" represent those results below the detection limit of 10 colonies.  
 \*\*\* TSS values below the detection limit 1 mg/l are graphed as "0.9" mg/l.

### 2002 East Branch - Orchard Road

Parameter	April '02	May '02	June '02	July '02	Aug. '02	Sept. '02	Oct. '02
Dissolved Oxygen in mg/l	10.66	10.36	8.38	7.14	6.48	6.94	9.00
pH	7.68						7.87
Alkalinity in mg/l carbonate	60.0						110.00
Fecal Coliform in colonies/100ml **	470	810	90	420	210	290	90
E-coli in colonies/100 ml **	480	790	80	290	210	250	40
Total Phosphorus in mg/l *	0.010	0.08	0.020	0.020	0.009	0.030	0.009
Nitrate-Nitrogen in mg/l *	0.130	0.04	0.140	0.310	0.480	0.450	0.290
Water Temperature in degrees Celsius	7.0	7.5	16.0	18.0	17.5	15.5	9.5
Total Suspended Solids in mg/l						10	1
Turbidity in NTU							1.5

### 2003 East Branch - Orchard Road

Parameter	April '03	May '03	June '03	July '03	Aug. '03	Sept. '03	Oct. '03
Dissolved Oxygen in mg/l	10.52	9.66	8.64	7.02	7.52	8.72	9.56
pH	7.66						7.78
Alkalinity in mg/l carbonate	44						78
Fecal Coliform in colonies/100ml **	9	100	80	140	710	200	100
E-Coli in colonies/100 ml **	9	90	70	140	640	160	70
Total Phosphorus in mg/l *	0.019	0.037	0.027	0.022	0.080	0.022	0.009
Nitrate-Nitrogen in mg/l *	0.130	0.08	0.08	0.39	0.009	0.13	0.16
Water Temperature in degrees Celsius	7.5	10.5	15.5	19.0	20.5	15.0	9.5
Total Suspended Solids in mg/l ***	1	4	1	1	39	4	2

**2001 East Branch - State Park (Wahconah Falls Brook)**

PARAMETER	April '01	May '01	June '01	July '01	Aug '01	Sept '01	Oct '01
DISSOLVED OXYGEN in mg/l	11.54	8.72	8.00	8.32	7.46	8.32	
pH	6.95	7.40	7.33	7.63	7.71	7.86	
ALKALINITY in mg/l calcium carbonate	6.4	27.9	13.6	36.4	46.7	64.6	
FECAL COLIFORM in colonies/ 100 ml	<10	10	90	<10	20	70	
NITRATE-NITROGEN in mg/l	0.07	0.10	<0.01	0.07	0.05	0.12	
TOTAL PHOSPHORUS in mg/l	<0.01	0.010	0.02	0.01	<.01	0.06	
WATER TEMPERATURE in degrees Celsius	5.0	13.0	17.0	16.5	17.0	14.0	
AIR TEMPERATURE in degrees Celsius	8.0	11.0	14.0	12.0	15.0	12.0	

**2002 East Branch - State Park (Wahconah Falls Brook)**

Parameter	April '02	May '02	June '02	July '02	Aug. '02	Sept. '02	Oct. '02
Dissolved Oxygen in mg/l	10.34	10.48	8.04	8.34	8.26	8.20	9.62
pH	7.30	7.17					7.71
Alkalinity in mg/l calcium carbonate	20.0	16.0					84.00
Fecal Coliform in colonies/100ml **	9	160	<10	30	<10	40	20
E-coli in colonies/100 ml **	9	180	<10	20	<10	40	20
Total Phosphorus in mg/l*	0.010	0.01	<0.01	0.040	0.010	0.010	0.010
Nitrate-Nitrogen in mg/l *	0.040	0.03	0.010	0.160	0.120	0.100	0.030
Water Temperature in degrees Celsius	9.0	8.0	17.0	15.0	15.0	13.5	7.5
Total Suspended Solids in mg/l ***						6	<1
Turbidity in NTU							0.35

\* Values of "0.009" are used to graph those results below the detection limit of 0.01 mg/l.  
 \*\* Bacteria values of "9" represent those results below the detection limit of 10 colonies.  
 \*\*\* TSS values below the detection limit 1 mg/l are graphed as "0.9" mg/l.

**2003 East Branch - State Park (Wahconah Falls Brook)**

Parameter	April '03	May '03	June '03	July '03	Aug. '03	Sept. '03	Oct. '03
Dissolved Oxygen in mg/l	12.28	9.62	9.08	8.28	7.98	8.70	9.62
pH	7.07						7.41
Alkalinity in mg/l carbonate	14						28
Fecal Coliform in colonies/100ml **	10	100	10	50	410	40	20
E-Coli in colonies/100 ml **	10	90	10	10	390	20	10
Total Phosphorus in mg/l *	0.022	0.027	0.019	0.022	0.027	0.019	0.009
Nitrate-Nitrogen in mg/l *	0.130	0.03	0.010	0.16	0.02	0.05	0.04
Water Temperature in degrees Celsius	3.5	12.0	15.0	6.0	20.0	15.0	10.0
Total Suspended Solids in mg/l ***	1	1	1	1	13	1	3

**2002 East Branch - Cleveland Road (Wahconah Falls Brook)**

Parameter	April '02	May '02	June '02	July '02	Aug. '02	Sept. '02	Oct. '02
Dissolved Oxygen in mg/l							
pH							7.82
Alkalinity in mg/l carbonate							116.00
Fecal Coliform in colonies/100ml **	9	200	160	380	100	280	30
E-coli in colonies/100 ml **	9	190	210	340	90	210	30
Total Phosphorus in mg/l *	0.010	0.010	<0.01	<.01	<.01	0.010	<.01
Nitrate-Nitrogen in mg/l *	0.140	0.05	0.120	0.510	0.610	0.580	0.430
Water Temperature in degrees Celsius							
Total Suspended Solids in mg/l ***						7	<1
Turbidity in NTU							0.29

**2003 East Branch - Cleveland Road (Wahconah Falls Brook)**

Parameter	April '03	May '03	June '03	July '03	Aug. '03	Sept. '03	Oct. '03
Dissolved Oxygen in mg/l							
pH	7.18						7.61
Alkalinity in mg/l carbonate	16						59
Fecal Coliform in colonies/100ml **	20	150	160	210	200	100	80
E-Coli in colonies/100 ml **	10	150	120	180	160	80	60
Total Phosphorus in mg/l *	0.038	0.027	0.017	0.014	0.033	0.032	0.011
Nitrate-Nitrogen in mg/l *	0.150	0.06	0.15	0.63	0.03	0.23	0.28
Water Temperature in degrees Celsius							
Total Suspended Solids in mg/l ***	0.9	0.9	0.9	0.9	14	0.9	2

**2001 East Branch - Wahconah Falls Brook at Rt. 9**

PARAMETER	April '01	May '01	June '01	July '01	Aug. '01	Sept. '01	Oct. '01
DISSOLVED OXYGEN in mg/l			8.84	8.56	7.00	8.16	9.60
pH			7.35	7.67	7.81	7.70	7.80
ALKALINITY in mg/l calcium carbonate			19.1	62.4	77.5	62.6	82.2
FECAL COLIFORM in colonies/100 ml			180	440	260	720	60
NITRATE-NITROGEN in mg/l			0.09	0.33	0.27	0.21	0.18
TOTAL PHOSPHORUS in mg/l			0.02	0.01	<.01	0.03	<0.01
WATER TEMPERATURE in degrees Celsius			15.5	16.0	17.5	15.0	6.0
AIR TEMPERATURE in degrees Celsius			16.5	15.5	17.0	12.5	-1.0

\* Values of "0.009" are used to graph those results below the detection limit of 0.01 mg/l.  
 \*\* Bacteria values of "9" represent those results below the detection limit of 10 colonies.  
 \*\*\* TSS values below the detection limit 1 mg/l are graphed as "0.9" mg/l.

**2002 East Branch - Wahconah Falls Brook & Route 9**

Parameter	April '02	May '02	June '02	July '02	Aug. '02	Sept. '02	Oct. '02
Dissolved Oxygen in mg/l	11.32	8.58	8.82	7.82	7.16	6.96	8.68
pH	7.52						7.84
Alkalinity in mg/l carbonate	34.0						118.00
Fecal Coliform in colonies/100ml **	20	920	100	360	140	70	50
E-coli in colonies/100 ml **	10	980	90	380	120	50	40
Total Phosphorus in mg/l *	0.009	0.02	<0.01	<.01	<.01	0.010	<.01
Nitrate-Nitrogen in mg/l *	0.170	0.06	0.160	0.390	0.350	0.330	0.200
Water Temperature in degrees Celsius	6.0	8.5	13.0	18.0	18.0	13.0	9.0
Total Suspended Solids in mg/l***						6	<1
Turbidity in NTU							0.4

**2003 East Branch - Wahconah Falls Brook at Rt. 9**

Parameter	April '03	May '03	June '03	July '03	Aug. '03	Sept. '03	Oct. '03
Dissolved Oxygen in mg/l	12.28	9.50	9.48	7.46	7.88	8.68	9.68
pH	7.14						7.59
Alkalinity in mg/l carbonate	16						49
Fecal Coliform in colonies/100ml **	30	160	210	250	420	140	240
E-Coli in colonies/100 ml **	30	140	180	180	220	120	190
Total Phosphorus in mg/l *	0.027	0.024	0.011	0.016	0.035	0.013	0.009
Nitrate-Nitrogen in mg/l *	0.170	0.07	0.15	0.43	0.05	0.25	0.27
Water Temperature in degrees Celsius	2.5	10.5	13.0	19.0	19.0	11.5	9.0
Total Suspended Solids in mg/l***	0.9	0.9	0.9	1	13	1	1

**2002 East Branch - High Street (Walker Brook)**

Parameter	April '02	May '02	June '02	July '02	Aug. '02	Sept. '02	Oct. '02
Dissolved Oxygen in mg/l	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
pH	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
Alkalinity in mg/l carbonate	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
Fecal Coliform in colonies/100ml **	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
E-coli in colonies/100 ml **	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
Total Phosphorus in mg/l *	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
Nitrate-Nitrogen in mg/l *	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
Water Temperature in degrees Celsius	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
Total Suspended Solids in mg/l ***	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
Turbidity in NTU	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow

**2003 East Branch - High Street (Walker Brook)**

Parameter	April '03	May '03	June '03	July '03	Aug. '03	Sept. '03	Oct. '03
Dissolved Oxygen in mg/l	9.90	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
pH	7.43	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
Alkalinity in mg/l carbonate	34	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
Fecal Coliform in colonies/100ml **	160	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
E-Coli in colonies/100 ml **	80	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
Total Phosphorus in mg/l *	0.040	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
Nitrate-Nitrogen in mg/l *	0.010	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
Water Temperature in degrees Celsius	8.0	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
Total Suspended Solids in mg/l ***	2	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow

### 2002 East Branch - Walker Brook Outflow

Parameter	April '02	May '02	June '02	July '02	Aug. '02	Sept. '02	Oct. '02
Dissolved Oxygen in mg/l	No Flow	9.60	5.74	No Flow	No Flow	No Flow	No Flow
pH	No Flow			No Flow	No Flow	No Flow	No Flow
Alkalinity in mg/l carbonate	No Flow			No Flow	No Flow	No Flow	No Flow
Fecal Coliform in colonies/100ml **	No Flow	1,900	20	No Flow	No Flow	No Flow	No Flow
E-coli in colonies/100 ml **	No Flow	2,400	20	No Flow	No Flow	No Flow	No Flow
Total Phosphorus in mg/l *	No Flow	0.02	0.020	No Flow	No Flow	No Flow	No Flow
Nitrate-Nitrogen in mg/l *	No Flow	0.32	1.270	No Flow	No Flow	No Flow	No Flow
Water Temperature in degrees Celsius	No Flow	7.5	13.5	No Flow	No Flow	No Flow	No Flow
Total Suspended Solids in mg/l***	No Flow			No Flow	No Flow	No Flow	No Flow
Turbidity in NTU	No Flow			No Flow	No Flow	No Flow	No Flow

### 2003 East Branch - Walker Brook Outflow

Parameter	April '03	May '03	June '03	July '03	Aug. '03	Sept. '03	Oct. '03
Dissolved Oxygen in mg/l	10.86	Very Low Flow	No Flow	No Flow	Low Flow	No Flow	No Flow
pH	7.88	Very Low Flow	No Flow	No Flow		No Flow	No Flow
Alkalinity in mg/l carbonate	132	Very Low Flow	No Flow	No Flow		No Flow	No Flow
Fecal Coliform in colonies/100ml **	170	2,000	No Flow	No Flow	650	No Flow	No Flow
E-Coli in colonies/100 ml **	130	1,700	No Flow	No Flow	560	No Flow	No Flow
Total Phosphorus in mg/l *	0.046	Very Low Flow	No Flow	No Flow	0.027	No Flow	No Flow
Nitrate-Nitrogen in mg/l *	0.840	Very Low Flow	No Flow	No Flow	1.45	No Flow	No Flow
Water Temperature in degrees Celsius	6.5	9.0	No Flow	No Flow		No Flow	No Flow
Total Suspended Solids in mg/l***	1	Very Low Flow	No Flow	No Flow	1	No Flow	No Flow



### 2001 East Branch - Hubbard Avenue

PARAMETER	April '01	May '01	June '01	July '01	Aug. '01	Sept. '01	Oct. '01
DISSOLVED OXYGEN in mg/l	11.36	9.04	9.58	8.64	7.52	7.16	10.36
pH	7.50	8.03	7.91	8.05	8.16	8.22	8.11
ALKALINITY in mg/l calcium carbonate	28.4	122.6	58.8	91.4	139.5	147.2	114.4
FECAL COLIFORM in colonies/ 100 ml	10	900	280	80	590	320	120
NITRATE-NITROGEN in mg/l	0.12	0.36	<0.01	0.27	0.40	0.34	0.20
TOTAL PHOSPHORUS in mg/l	<0.01	0.02	0.03	0.05	0.02	0.05	0.02
WATER TEMPERATURE in degrees Celsius	6.0	15.0	14.5	19.0	20.0	18.0	8.0
AIR TEMPERATURE in degrees Celsius	9.0	12.0	18.0	17.0	18.0	15.0	0.0

### 2002 East Branch – Hubbard Avenue

Parameter	April '02	May '02	June '02	July '02	Aug. '02	Sept. '02	Oct. '02
Dissolved Oxygen in mg/l	12.74	11.02	8.66	7.90	7.02	7.12	9.10
pH	7.83					8.00	8.06
Alkalinity in mg/l carbonate	70.0					200.00	164.00
Fecal Coliform in colonies/100ml	50	1,400	70	130	60	80	110
E-coli in colonies/100 ml	60	1,200	70	110	60	30	110
Total Phosphorus in mg/l	0.020	0.04	0.020	0.020	0.030	0.260	0.030
Nitrate-Nitrogen in mg/l	0.270	0.05	0.130	0.190	0.230	0.260	0.330
Water Temperature in degrees Celsius	9.0	7.5	18.0	21.0	22.5	19.5	12.5
Total Suspended Solids in mg/l***						13	2
Turbidity in NTU							2

\* Values of "0.009" are used to graph those results below the detection limit of 0.01 mg/l.  
 \*\* Bacteria values of "9" represent those results below the detection limit of 10 colonies.  
 \*\*\* TSS values below the detection limit 1 mg/l are graphed as "0.9" mg/l.

**2003 East Branch - Hubbard Ave.**

<b>Parameter</b>	<b>April '03</b>	<b>May '03</b>	<b>June '03</b>	<b>July '03</b>	<b>Aug. '03</b>	<b>Sept. '03</b>	<b>Oct. '03</b>
Dissolved Oxygen in mg/l	11.60	9.84	9.04	7.76	8.50	8.10	9.84
pH	7.61						7.96
Alkalinity in mg/l carbonate	36						88
Fecal Coliform in colonies/100ml **	20	160	70	200	600	150	150
E-Coli in colonies/100 ml **	9	160	60	110	350	140	130
Total Phosphorus in mg/l *	0.026	0.037	0.024	0.027	0.071	0.038	0.011
Nitrate-Nitrogen in mg/l *	0.17	0.10	0.11	2.34	0.07	0.17	0.42
Water Temperature in degrees Celsius	5.5	11.0	15.0	21.5	20.5	16.0	11.5
Total Suspended Solids ***	1	1	4	1	16	2	3

\* Values of "0.009" are used to graph those results below the detection limit of 0.01 mg/l.

\*\* Bacteria values of "9" represent those results below the detection limit of 10 colonies.

\*\*\* TSS values below the detection limit 1 mg/l are graphed as "0.9" mg/l.

Site Tables for Sites Monitored in 2001 and 2002 Only:

**Bullard's Crossing - 2001**

PARAMETER	April '01	May '01	June '01	July '01	Aug. '01	Sept. '01	Oct. '01
DISSOLVED OXYGEN in mg/l	7.66	4.56	5.76	4.18	2.74	2.60	3.70
pH	7.02	7.25	7.09	7.26	7.22	7.21	7.13
ALKALINITY in mg/l calcium carbonate	33.0	63.8	47.2	78.6	95.9	77.0	80.9
FECAL COLIFORM in colonies/ 100 ml	20	120	110	160	400	1,300	10
NITRATE-NITROGEN in mg/l	0.04	0.05	0.05	0.02	0.01	0.10	<0.01
TOTAL PHOSPHORUS in mg/l	<0.01	0.02	0.02	0.03	0.03	0.05	0.02
WATER TEMPERATURE in degrees Celsius	6	16	14	20	20	6	6.5
AIR TEMPERATURE in degrees Celsius	9.0	12.0	15.5	16.5	15.0	1.0	-3.0

**2002 East Branch - Bullard's Crossing**

Parameter	April '02	May '02	June '02	July '02	Aug. '02	Sept. '02	Oct. '02
Dissolved Oxygen in mg/l	5.84	5.72	2.74	0.64	1.68	1.38	1.14
pH	6.88						6.87
Alkalinity in mg/l carbonate	50.0						80.00
Fecal Coliform in colonies/100ml	30	3,900	120	40	100	490	60
E-coli in colonies/100 ml **	20	3,500	300	30	80	480	60
Total Phosphorus in mg/l *	0.010	<.01	0.020	0.090	0.060	0.080	0.060
Nitrate-Nitrogen in mg/l *	0.009	0.01	<0.01	<.01	<.01	<.01	<.01
Water Temperature in degrees Celsius	8	7.0	18	18.5	20.0	17.5	11.0
Total Suspended Solids in mg/l***						11	9
Turbidity in NTUs							4

\* Values of "0.009" are used to graph those results below the detection limit of 0.01 mg/l.  
 \*\* Bacteria values of "9" represent those results below the detection limit of 10 colonies.  
 \*\*\* TSS values below the detection limit 1 mg/l are graphed as "0.9" mg/l.

### Bennett Brook - 2001

PARAMETER	April '01	May '01	June '01	July '01	Aug. '01	Sept. '01	Oct. '01
DISSOLVED OXYGEN in mg/l	11.12	7.76	6.30	8.34	5.20	5.92	8.68
pH	6.84	6.96	7.06	6.98	7.13	6.94	7.22
ALKALINITY in mg/l calcium carbonate	8.8	19.0	19.3	15.6	31.0	26.9	21.4
FECAL COLIFORM in colonies/ 100 ml	<10	30	<10	<10	40	1,600	<10
NITRATE-NITROGEN in mg/l	0.15	0.06	0.06	0.02	0.04	0.09	<0.01
TOTAL PHOSPHORUS in mg/l	0.02	0.02	0.03	0.02	0.01	0.06	<0.01
WATER TEMPERATURE in degrees Celsius	4.0	7.0	14.0	15.0	15.5	17.0	10.0
AIR TEMPERATURE in degrees Celsius	7.0	11.0	18.0	12.0	17.0	12	-2.0

### 2002 East Branch - Bennett Brook

Parameter	April '02	May '02	June '02	July '02	Aug. '02	Sept. '02	Oct. '02
Dissolved Oxygen in mg/l	8.86	9.30	8.06	7.34	5.16	5.84	7.98
pH	6.86	7.33					6.91
Alkalinity in mg/l carbonate	24.0	19.0					28.00
Fecal Coliform in colonies/100ml *	9	20	<10	40	20	50	30
E-coli in colonies/100 ml **	9	10	10	20	20	50	20
Total Phosphorus in mg/l *	0.020	0.010	<0.01	0.040	0.010	0.030	<.01
Nitrate-Nitrogen in mg/l *	0.020	<.01	0.010	0.020	0.050	0.060	0.010
Water Temperature in degrees Celsius	6.0			16.5	18.5	17.0	12.0
Total Suspended Solids in mg/l						6	2
Turbidity in NTUs							1.3

### Frisell Brook - 2001

PARAMETER	April '01	May '01	June '01	July '01	Aug. '01	Sept. '01	Oct. '01
DISSOLVED OXYGEN in mg/l			7.60	7.50	6.54	6.66	8.84
pH			7.17	7.45	7.48	7.46	7.51
ALKALINITY in mg/l calium carbonate			31.9	27.4	33.2	40.7	33.6
FECAL COLIFORM in colonies/ 100 ml			10	40	80	20	<10
NITRATE-NITROGEN in mg/l			0.10	0.02	<.01	0.08	0.02
TOTAL PHOSPHORUS in mg/l			0.02	0.02	<.01	0.03	<0.01
WATER TEMPERATURE in degrees Celsius				20.5	21.5	17.0	11.5
AIR TEMPERATURE in degrees Celsius				16.0	17.0	13.0	3.0

### 2002 East Branch - Frisell Brook

Parameter	April '02	May '02	June '02	July '02	Aug. '02	Sept. '02	Oct. '02
Dissolved Oxygen in mg/l	8.82	7.14	7.96	7.14	6.88	7.42	7.84
pH	7.36						7.29
Alkalinity in mg/l carbonate	28.0						44.00
Fecal Coliform in colonies/100ml **	9	10	<10	20	30	30	40
E-coli in colonies/100 ml **	9	10	10	10	10	20	20
Total Phosphorus in mg/l *	0.010	<.01	<0.01	0.010	0.020	0.010	<.01
Nitrate-Nitrogen in mg/l *	0.009	0.02	0.010	0.020	0.020	0.020	0.020
Water Temperature in degrees Celsius	10.0	10.0	18.0	22.0	23.0	20.0	10.0
Total Suspended Solids ***						8	<1
Turbidity in NTUs							0.35

### Center Pond Bridge - 2001

PARAMETER	April '01	May '01	June '01	July '01	Aug. '01	Sept. '01	Oct. '01
DISSOLVED OXYGEN in mg/l			8.36	7.12	7.20	6.88	9.34
pH			7.52	7.85	7.88	7.77	7.90
ALKALINITY in mg/l calcium carbonate			42.8	75.9	107.2	108.0	79.6
FECAL COLIFORM in colonies/ 100 ml			250	150	280	980	60
NITRATE-NITROGEN in mg/l			0.16	0.16	0.27	0.34	0.16
TOTAL PHOSPHORUS in mg/l			0.02	0.03	0.010	0.06	0.010
WATER TEMPERATURE in degrees Celsius			14.5	20.0	20.5	18.0	8.0
AIR TEMPERATURE in degrees Celsius			15.0	14.0	16.5	14.0	-3.0

### 2002 East Branch - Center Pond Bridge

Parameter	April '02	May '02	June '02	July '02	Aug. '02	Sept. '02	Oct. '02
Dissolved Oxygen in mg/l	10.28	10.00	7.68	9.00	8.44	9.48	8.96
pH	7.63						7.98
Alkalinity in mg/l carbonate	54.0						106.00
Fecal Coliform in colonies/100ml **	20	740	110	120	70	180	410
E-coli in colonies/100 ml **	30	980	170	100	60	130	320
Total Phosphorus in mg/l *	0.010	0.04	0.02	<.01	0.010	0.040	0.020
Nitrate-Nitrogen in mg/l *	0.010	0.05	0.130	0.160	0.150	0.110	0.160
Water Temperature in degrees Celsius	7.0	7.5	16.0	21.0	24.0	20.0	11.5
Total Suspended Solids in mg/l***						9	5
Turbidity in NTUs							2.2

\* Values of "0.009" are used to graph those results below the detection limit of 0.01 mg/l.  
 \*\* Bacteria values of "9" represent those results below the detection limit of 10 colonies.  
 \*\*\* TSS values below the detection limit 1 mg/l are graphed as "0.9" mg/l.

## **East Branch Weather on our Sampling Days in 2001**

April 26, 2001: 25th = overcast. Has been warm and dry. A lot of snow melt about 10 day ago. 26th = clear. Has been warm and dry.

May 22, 2001: Today was the first day of rain in almost 5 weeks. It started raining last evening.

June 12, 2001: Overcast today. Was dry for a week, then rained yesterday and last evening.

July 10, 2001: Clear. Showers earlier in the week, then dry, until a little rain last night.

August 14, 2001: Has been hot and humid. Rained 2 days ago, heavy at times.

September 11, 2001: It has been warm and dry, but it rained yesterday and last night (heavy at times).

October 9, 2001: Cold and clear. Has been warm and dry but the temperatures dropped over the weekend and there was some rain/hail on Saturday a.m. (our monitoring occurs on Tuesday mornings).

## **Weather and Notes Regarding the 2002 East Branch Sampling Days:**

April 25, 2002: Today is clear to partly cloudy, and cool, with no recent rain. The weather has been variable, with both cold and unseasonably warm weather. Flows are low and we are under a drought watch from the low snow fall amounts this past winter.

A 3 foot long beaver was seen swimming at the Bennett Brook site.

Turbidity was measured at the Partridgefield site with equipment from the Crane Paper company to be <2NTUs. pH was also measured with their meter to be 7.74.

The powder pillow #3 used at Orchard Road seemed more granular and the floc took longer to settle than usual. Within 20 minutes it looked fine.

No flow was found in Walker Brook at High Street, or at the outflow where it joins the East Branch. The only water at the outflow site was in puddles between the rocks.

A dead fry (trout?) was found at the Hubbard site. The water is lower than in April '01.

May 14, 2002: Overcast and drizzling today. Rain, sometimes heavy, in past few days, resulting in very high flows today. Temperatures have been in the 50s and 60s.

The culvert at Bullard's Crossing was 90% plugged by beavers. The river was overflowing the roadway.

The beaver dam at Bennett Brook has apparently been breached.

The water was so high at WFB & Rte.9 that the samples were taken from the bank.

Walker Brook was just a puddle at High Street, and only 4-5 inches deep at the outflow.

At Hubbard, flow was about 2 feet higher this month than last so the samples were taken from the bank here also.

June 11, 2002: Partly cloudy then clearing this morning, with no rain in the past few days. It has been sunny and warm but there was some rain, heavy at times, 4-5 days ago.

Beavers very active at Bullard's Crossing. The thermometer came apart.

The beaver was spotted again at Bennett Brook.

Crayfish and turkey tracks were seen on the shore at Home Club.

Black flies were seen at WFB & Rte. 9.

There was no running water in Walker Brook at High Street. At the outflow, the water was very shallow. There was ~1/2 inch of clear water coming out of the drain under Rt.9 by the Post Office. The storm drains look dry. Rushing water could be heard in the manhole nearby.

July 9, 2002: Dry, and partly cloudy to overcast this morning. It has been clear and hot, with no rain in the past week. Hazy on Sunday from forest fires in Quebec, and still overcast this morning. Water levels very low.

Bullard's Crossing had water running over the road again due to the beaver activity.

A film was seen on top of the water at both Bennett Brook and Center Pond Bridge (both sites have slow moving water). At Center Pond Bridge there were also lots of leaves, twigs, weeds and "junk" on the surface of the water.

The water was about 3 feet lower than last month at the Metal Bridge site.

No flow in Walker Brook today.

Water very low at Hubbard Ave.

August 13, 2002: Clear but hazy this morning. It has been hot and dry and the water levels are very low.

The culvert at Bullard's Crossing is completely blocked.

There is a film on the water at Bennett Brook.

The water at the Metal Bridge site is about 6 feet lower, in fact there is no water up near the dam.

At Partridgefield the water was very low but there were lots of crayfish.

The floc in the DO samples at the High School and Orchard Rd, never really settled, even after 5-10 minutes (we thought about buying new powder pillows but we are still passing our QC samples with these pillows, so we decided they must still be fine). There was an iridescence in the water at the edge of the bank at Orchard Rd, and there was a greenish mat that started at the edge and extended into the stream (nitrates were very high that day, as well as the previous month).

The WFB & Rte 9 the brook was quite low but full of little fish and insects.

Center Pond Bridge had a surface sheen as well as debris and goose droppings floating on the surface.

At Hubbard Ave the water was so low the sampling had to be done 2/3rds the way across the channel to find water deep enough for sampling. The DO floc was long in forming, and did not form as sharp a line as usual.

September 10, 2002: Clear today, with some morning haze. It has been warm to hot, humid and sunny.

Hinsdale Town crew removed the beaver dam at Bullard's Crossing and cut back the brush around the culvert. Beavers have started to rebuild.

The film on the water at Bennett Brook is now gone.

Algae was noticed along the edge of Wahconah Falls Brook, at Rt. 9, for the first time. Lots of minnows, too.

The water at Hubbard Ave had an oily feel to it, and was found to have a very high alkalinity level on this day.

October 8, 2002: Clear today. Cool and drizzly yesterday with some light rain. It has been dry for days, until yesterday. Temperatures in the 50s -60s.

The beaver dam at the Bennett Brook site has been breached and the water level is now 4 feet lower.



The floc was slow to settle in the D.O. sample taken at Orchard Road. The air temp reading of 1° C was suspiciously low, probably due to still being wet from being used at the High School site, where the air temp was 4 degrees Celsius. These two sites should be similar. Samples were taken at the Hubbard site at the same time DEP took samples with its HydroLab meter.

### **Weather and Notes Regarding the 2003 East Branch Sampling Days:**

April 15, 2003: Clear today, and it has been clear this past week, in the 50s-60s, with a couple of inches of snow last week. Snow still on the ground up at the State Park, though none left in town.

Home Club: Water tea-colored but clear with no odor.

Carmel House: Water tea-colored but clear with no odor.

Partridgefield: Clear water with no odor. Snow cover gone, water at spring level.

High School: Clear water with no odor.

Orchard: Clear water with no odor.

State Park: Clear water with no odor. Snow up to the volunteers' knees!

Cleveland Road: Clear water with no odor.

WFB at Rt. 9: Clear water with no odor.

Hubbard: Clear water with no odor.

May 13, 2003: Rained heavily on Sunday, the 11th (2 days ago), with a little more rain yesterday and drizzle this morning. Flow pretty high and fast today.

Metal Bridge: Water tea-colored but clear with no odor.

Carmel House: Clear water with no odor.

Partridgefield: Water tea-colored but clear with no odor. River flowing swiftly.

Orchard: Clear water with no odor. Lots of sediment in the water. Pretty good, high flow; bank to bank. Ducks just upstream on the lawn. Fishermen at and below the site while sampling. Floc slow to settle.

State Park: Clear water with no odor.

Cleveland Road: Clear water with no odor.

WFB at Rt. 9: Clear water with no odor. Fishy smell in air. Flow pretty high and fast. Some sediment in water. Floc relatively slow to settle.

High Street: No Flow.

Walker Brook Outflow: Not enough flow to submerge the larger bottles.

Hubbard: Water tea-colored to muddy, with no odor. Water felt slightly greasy at the time of sampling. Water up 6" or so.

June 10, 2003:

Rained on Saturday, the 7th. Partly cloudy this morning, though yesterday afternoon was sunny. It has been cloudy, cool and damp lately.

Home Club: Water tea-colored but clear.

Metal Bridge: Clear water with no odor.

Carmel House: Water tea-colored but clear.

Partridgefield: Clear water with no odor.

High School: Clear water with no odor. Air almost smells like it does when they're repaving a road.

Orchard: Lots of minnows.

State Park: Clear water with no odor. Low flow.

Cleveland Road: Clear water with no odor.

WFB at Rt. 9: Clear water with no odor. Flow is surprisingly low considering all the rain we've had (frequent storms but not a lot of rain).

High Street: No Flow.

Walker Brook Outflow: Flow too shallow to sample. No flow at all coming out of culvert under Rt. 8&9 by the Post Office. A large pile of composted material (grass clippings?!) on the bank at the confluence of Walker Brook.

Hubbard: Water tea-colored but clear with no odor.

#### July 8, 2003:

Overcast today, but has been hot and humid. No significant rain in more than a week (0.01" on the 6th, and 0.03" on June 30th).

Home Club: Very little flow. Lots of clams, a snail and a dead crayfish.

Metal Bridge: Water brown with musky odor. Water very low.

Carmel House: Murky colored water. Lots of crayfish!

Partridgefield: Water tea-colored but clear with no odor. Water level low. Saw a crayfish and water bugs.

High School: Clear water with no odor.

Orchard: Clear water with no odor.

State Park: Clear water with no odor.

Cleveland Road: Clear water with no odor.

WFB at Rt. 9: Clear water with no odor. Air had garbage smell.

High Street: No Flow.

Walker Brook Outflow: No Flow.

Hubbard: Water tea-colored but clear with no odor.

#### August 12, 2003:

Three inches of rain fell on the 10th and 11<sup>th</sup>! It has been very wet, hot and muggy. Periodic rain for the past 10 days. Overcast with some drizzle this morning. According to the Berkshire Eagle, August will have 5.83" of rain, in comparison to the average of 4.46"

Home Club: Water tea-colored but clear. Very high water.

Metal Bridge: Water tea-colored but clear with musky odor.

Carmel House: Water tea-colored but clear with no odor. Very high water.

Partridgefield: Water tea-colored but clear.

High School: Water tea-colored but clear.

Orchard: Water tea-colored with particles and no odor.

State Park:

Cleveland Road: Water is muddy with no odor. Brook is so high it is roaring! Water is over the banks.

WFB at Rt. 9: Water tea-colored but clear. The river is ripping.

High Street: No flow this morning but volunteer Cas Makowski did see it flowing last night after yesterday afternoon's heavy rain. He saw sufficient flow to be able to sample but couldn't due to the lab being closed.

Walker Brook Outflow: Clear water with no odor. Fast flow but shallow. Couldn't fill jug all the way. Backwater washing up into the brook from the main stem due to the water being so high today.

Hubbard: Water dark brown and muddy with no odor. Very high water level. Couldn't wade into the water due to depth.

September 9, 2003:

Clear this morning, around 70 degrees out. As been clear and mild for days. Last rains were on Sept. 2, 3, and 4 (2 inches fell over those 3 days). September will have almost twice the usual precipitation (6.95" instead of the average 3.52"), according to records kept by the Berkshire Eagle.

Metal Bridge: Clear water with no odor.

Partridgefield: Clear water with no odor. Bubbles and ripples on top of water.

High School: Clear water with no odor.

Orchard: Clear water with no odor.

State Park: Clear water with no odor.

Cleveland Road: Clear water with no odor.

WFB at Rt. 9: Water tea-colored but clear with no odor.

High Street: No Flow.

Walker Brook Outflow: Bone dry. Man at River Run apartments spraying an herbicide on the weeds in the parking lot and gutters.

Hubbard: Water tea-colored but clear with no odor.

October 14, 2003:

Clear and warm today, as well as this past week. Two volunteers noticed some light rain two days ago, though the USGS gauging station at Coltsville didn't register any precipitation for the past 7 days. Had a frost last night. The month of October will have 5.25" of rain, in comparison to the average of 3.26" (source: Berkshire Eagle)

Home Club: Water tea-colored but clear. Oily sheen along the river bank.

Metal Bridge: Water tea-colored but clear with no odor.

Carmel House: Water tea-colored but clear with no odor.

Partridgefield: Water clear with no odor. EarthTech (Tyco International Co.) worker was taking samples there too. Usually samples on Mondays, once a month.

High School: Clear water with no odor.

Orchard: Clear water with no odor.

State Park: Clear water with no odor.

Cleveland Road: Clear water with no odor. Water surprisingly high.

WFB at Rt. 9: Clear water with no odor. Flow is relatively high despite a week without rain.

High Street: No Flow.

Walker Brook Outflow: No flow out of culvert under Rt. 8&9. A little flow and water between the rocks at the confluence but not enough to be able to sample. No sign of obvious water source (three storm drain pipes seen but all were dry).

Hubbard: Water tea-colored but clear with no odor.