

Monitoring the Hoosic: North Branch and Main Stem in 2001

Report dated 11/28/01 prepared by monitoring coordinator Dick Schlesinger

The Hoosic River Watershed Association has been conducting water quality sampling within the Hoosic River and its tributaries for the past several years. The objectives of the monitoring program include identifying areas of concern, establishing baseline conditions, and following up on previous sampling efforts. This report documents the results from the year 2001 sampling for bacteria within the North Branch of the Hoosic River, from Stamford, Vt. downstream to its confluence with the main stem in North Adams, and the main stem from Cheshire Lake downstream to the USGS stream flow gauge near Williamstown. (The gauge site is currently in North Adams, but was previously in Williamstown and is thus labeled as “near Williamstown”.)

Background.

The North Branch is classified as suitable for a cold water fishery and for primary recreational activities (Class B) such as swimming, wading, and fishing (Hudson River Basin 1997 Water Quality Assessment Report, 2000). Both the middle basin and north basin of Cheshire Lake are classified Class B, high quality waters. From the outlet of the lake downstream to the Adams wastewater treatment plant, the Hoosic is classified as Class B, cold water fishery, while the remaining sections from the treatment plant to the USGS streamflow gauge is Class B, warm water fishery.

Fecal coliform bacteria are an indicator of water quality for these uses, although these bacteria are not in themselves necessarily hazardous to human health. Massachusetts has established specific levels/thresholds that are used to judge whether the water quality is good enough for the classified uses (Massachusetts Surface Water Quality Standards, 314 CMR 4.00).

Fecal Coliform Bacteria - Shall not exceed a geometric mean of 200 organisms per 100 milliliters (ml) in any representative set of samples nor shall more than 10% of the samples exceed 400 organisms per 100 ml. This criterion may be applied on a seasonal basis at the discretion of the Department. The Department of Environmental Protection (DEP) gives the following guidance in the Hudson River Basin 1997 Water Quality Assessment Report, 2000.

1. Dry weather guidance – for less than 5 samples within a 1 month period, less than or equal to 400 colonies per 100 ml sample. Dry weather can be defined as: no or trace antecedent precipitation that causes no more than a slight increase in stream flow.
2. Wet weather guidance – dry weather samples meet the above and wet samples less than or equal to 2000 colonies per 100 ml. Wet weather can be defined as; precipitation antecedent to sampling that results in a marked increase in stream flow.

The following sixteen sites were sampled on five dates. (See also Figs. 1a and 1b for site locations). The eight main stem sites were samples a one group and the eight North Branch sites as a second group.

Main stem group. The distances for the first seven sites are from the Mass./Vt. line in Williamstown. The distance to the last site is from the Cheshire Lake dam.

HR08.96 downstream of the USGS flow gauge, opposite Treet Cleaners.
HR15.73 downstream of the Foundry bridge.
HR18.65 upstream of Hodges Cross Rd. bridge.
HR23.72 upstream of the Lime St. bridge.
HR27.81 upstream of the Route 8 bridge opposite the Old Stone Mill.

HR30.53 at the abandoned railroad bridge (Ashuwillicook Trail crossing) in Cheshire Harbor.

HR37.56 downstream of Cheshire Lake dam, just north of Route 8.

CL02.48 at the pipe connecting the middle and north basins of Cheshire Lake at Farnums Causeway.

North Branch group. The distances are from the confluence of each tributary with the larger stream into which it flows.

NB00.40 upstream side of the Marshall St. bridge.

HB00.03 Hudson Brook near its confluence with the North Branch.

NB03.17 just upstream of Hudson Brook.

NB05.58 just downstream of Canyon Brook.

CB00.03 Canyon Brook near its confluence with the North Branch.

BC00.03 Beaver Creek (a.k.a. the outlet from Mauserts Pond) near its confluence with the North Branch.

NB08.27 just upstream of Beaver Creek.

NB10.35 downstream of the Bridge at the Lane in Stamford, Vermont.

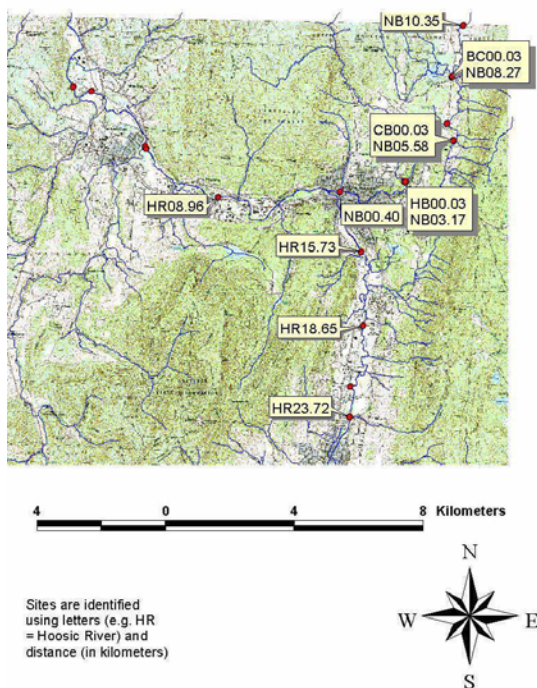


Figure 1a. Locations of monitoring sites.

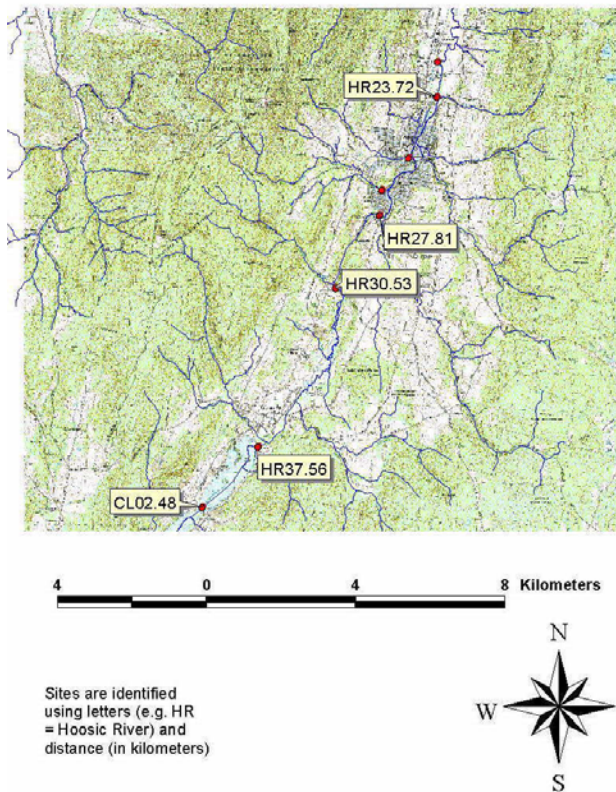


Figure 1b. Locations of monitoring sites.

Samples were collected in May, June, July, August, and September. During the week prior to the 5/17/01 sample, the rainfall was 0.50" on 5/12 and 0.04" on 5/14. The USGS gauge on the Hoosic River opposite Treet Cleaners in North Adams showed a peak flow of about 210 cfs (cubic feet per second) on 5/12, dropping to about 130 cfs on 5/17, which is below the median flow for the date. Based on the rainfall and flow records, the sample would be a dry weather sample.

There was 0.64" of rain on 6/11 and an additional 0.08" on 6/12, prior to the sampling on 6/12. The USGS gauge showed the peak flow on 6/12 at 750 cfs. The flow was down to 550 cfs at the time of sampling, which was still well above the median for the date. Based on the rainfall and flow data, this sample was classified as a wet weather sample.

During the week prior to the 7/10/01 sample, the rainfall was 0.23" on 7/4 and 0.79" on 7/8. The

Hoosic gauge showed the peak flow to be about 360 cfs on 7/8, dropping to about 150 cfs at the time of sampling. This flow level was slightly above the median for that date. The sample was considered a dry weather sample.

There was 0.62" of rain on 8/12 prior to the 8/14/01 sample. The USGS gauge showed the peak flow of 280 cfs on 8/12. At the time of sampling, the flow was only 85 cfs and below the median for that date. Thus the sample was a dry weather sample. Conditions were similar for the 9/19 sampling. There was 0.53" of rain on 9/14 with the peak flow for that date at 100 cfs. The flow on 9/19 was at 65 cfs, below the median. Thus this sample too was a dry weather sample.

Methods

Water samples were collected in sterile bottles provided by Berkshire Enviro-Labs, Inc. Each crew of two people collected samples at eight sites on the morning of the sample day. At one of the

eight sites, a second replicate/quality control sample was taken. The samples were transported in a cooler to the laboratory in Lee and dropped off at or before noon the same day. The samples were processed by the laboratory for total coliforms (using Standard Methods 9222 B) and fecal coliforms (using Standard Methods 9222 D). Our analyses of the laboratory results focus on fecal coliforms.

Results and Discussion

All of the main stem sites were well below the dry weather threshold on the May sample date (Fig. 2). On the one wet weather sample day (June, Fig. 2), HR08.96 did exceed the wet weather threshold of 2000 colonies/100ml. It is important to note that this site is downstream of the confluence with the North Branch and thus is influenced by that major tributary as well as reflecting conditions within the main stem. The other seven sites, although generally having higher counts than in

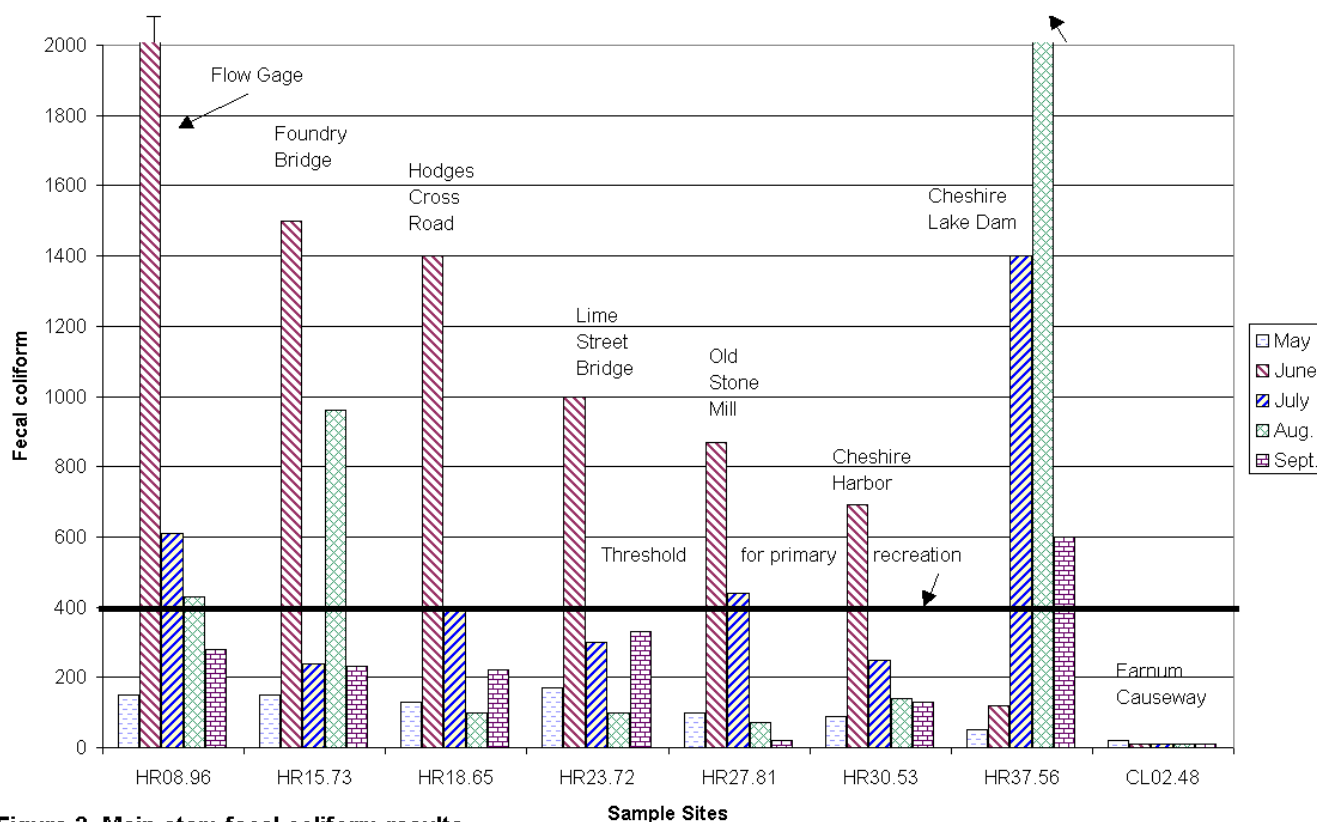


Figure 2. Main stem fecal coliform results.

May, were all below the wet weather threshold.

The fecal coliform levels at the July date were above the dry weather threshold at 3 of the 8 sites, and exactly at it at one other. HR37.56, just downstream of the Cheshire Lake dam had by far the highest number. This sample location is within an area of partially pooled waters with very slow flow. In 1997, DEP reported both of their samples above the threshold at (or very near) this site (their site HR08A) (Hudson River Basin 1997 Water Quality Assessment Report, 2000). Our other two sites which were above the threshold, HR08.96 and HR27.81, were not sampled by DEP in 1997. HR18.65 at Hodges Cross Rd. bridge, which was at the dry weather threshold, was found to be well above the threshold by DEP in 1997 (their site HR07).

The August levels were still too high at HR08.96 and especially at HR37.56. They were also much higher at the Foundry Bridge site (HR15.73). In

September, only HR37.56 was above the dry weather threshold. In 1997, DEP sampled at HR18.65 (their HR07) and at HR23.72 (their HR07A). Their July samples at both sites were well above the threshold, as was their HR07 September sample. Our 2001 sampling did not detect any excursions above the thresholds for primary recreation at those two sites.

Of note also is that the levels at Farnums Causeway (CL02.48) were very low at all times. There has been concern in the past that the middle basin of Cheshire Lake could be contributing to the high levels of fecal coliform detected downstream of the dam on the north basin. Our data would not support that hypothesis.

On the North Branch, the Marshall St. site (NB00.40) was consistently well above the dry weather threshold on all sampling dates (Fig. 3). However, the June sample, which was a wet weather sample, was not only below the wet

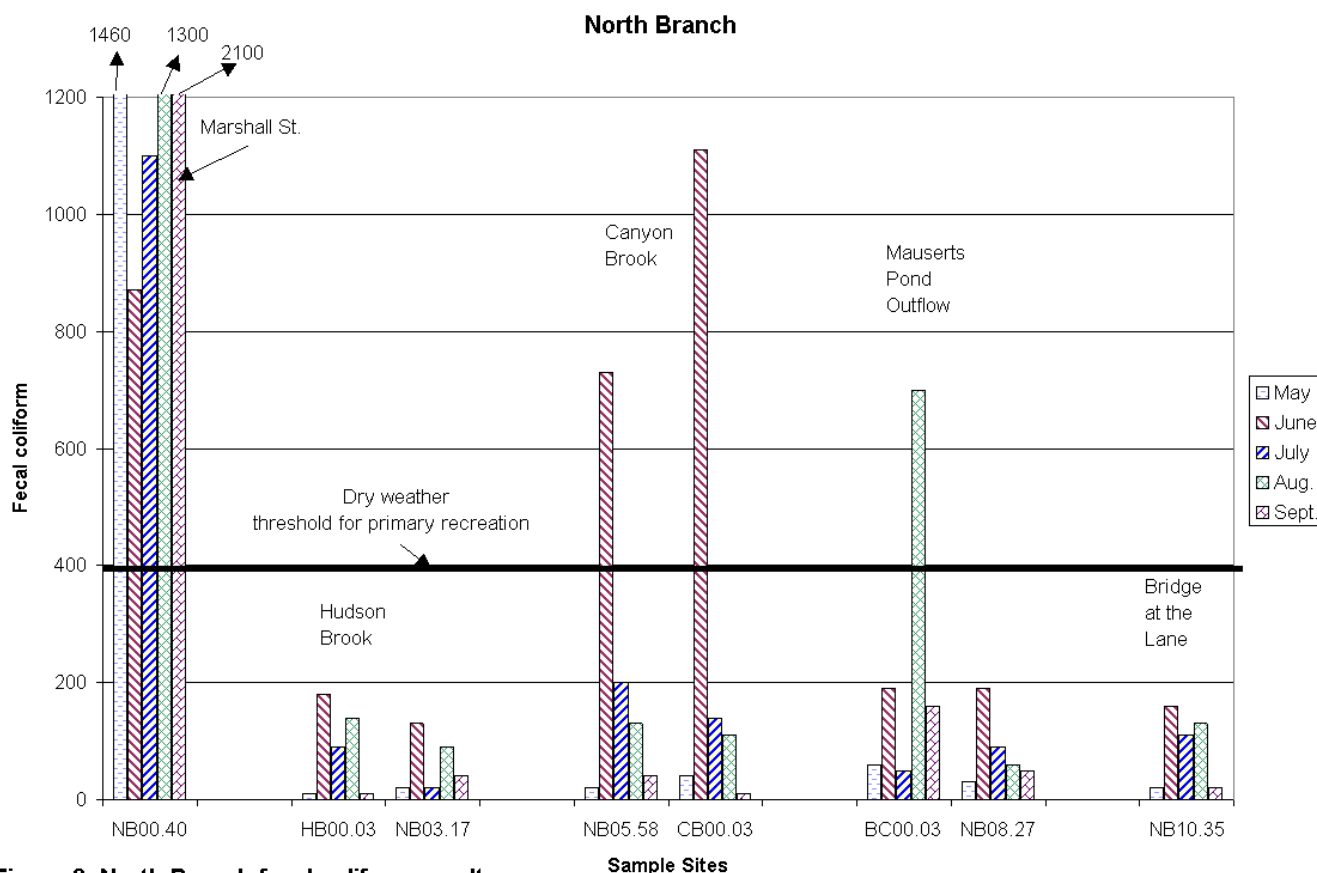


Figure 3. North Branch fecal coliform results

weather threshold, but was also the lowest of the five samples, possibly as the result of the high flow on that date.

The Hudson Brook site (HB00.03) and the site just upstream in the North Branch (NB03.17) were consistently well below the thresholds. Site (NB03.17) was sampled by DEP in 1997 (HR09A). Both of their samples were well below the dry weather threshold (Hudson River Basin 1997 Water Quality Assessment Report, 2000). This site was also sampled by HooRWA (Johnson, 1998, site #5) in 1996 and 1997, with similar results.

Canyon Brook, and the North Branch site downstream of the confluence of Canyon Brook with the North Branch, had high fecal coliform counts in June, but were still well below the wet weather threshold. The only excursion above the primary recreation thresholds other than at Marshall St. was in August in the Mauserts Pond outflow (Beaver Creek, BC00.03). Otherwise, all of the North Branch sites met the criteria for its

designated use.

When monitoring bacteria levels, sampling variability is of concern as is the difficulties in obtaining consistent results from the laboratory procedures. The replicate samples collected during the monitoring provide information on the combined effects of the two. The standard of comparison is the relative percent difference (RPD), calculated as the difference between the logarithms of two samples divided by the mean of the two logarithms. For the samples from the main stem and North Branch, the RPD for 8 of the 10 replicate samples was less than the 30% standard used in the Hudson River Basin 1997 Water Quality Assessment Report (Fig. 4).

One of the two quality control pairs that exceeded the 30% standard consisted of samples with 30 colonies versus 10 colonies. This results in a RPD of 39%, but is probably of no real significance because of the very low values. The other pair, which had a RPD of 38%, consisted of one sample at 120 and the other at 1100 colonies, and was

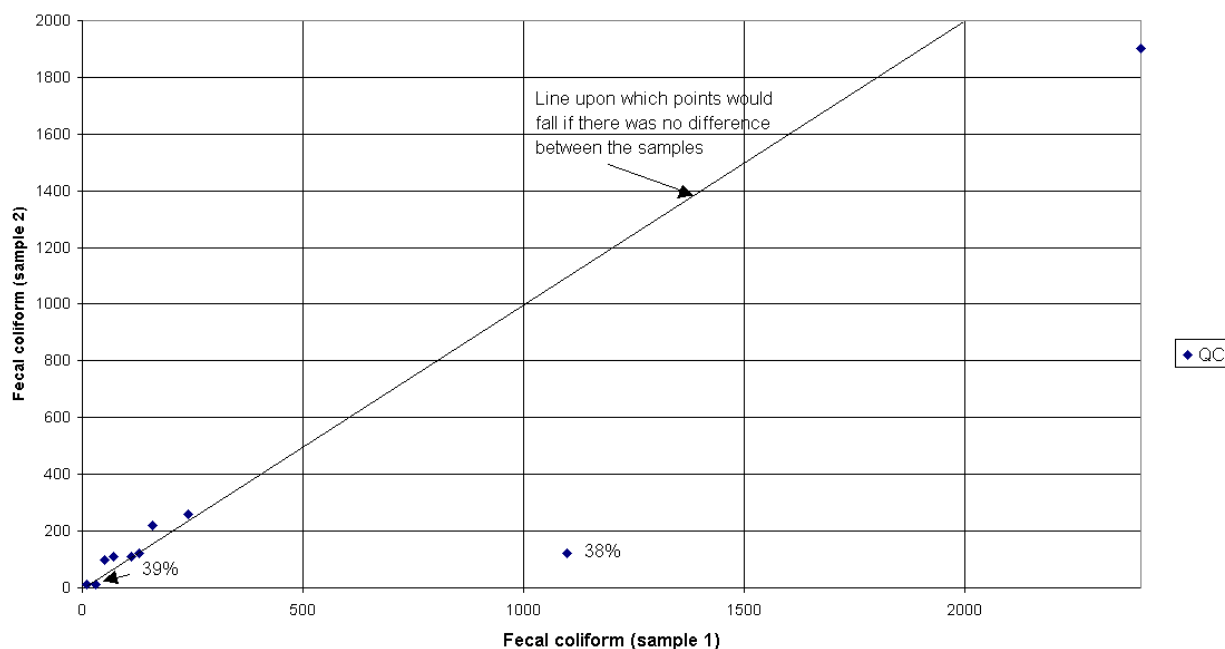


Figure 4. Quality control results.

definitely above the desired standard.

Conclusions

The 2001 monitoring results for fecal coliform on the main stem and the North Branch of the Hoosic showed generally good conditions, although there continue to be a couple of areas of concern. The area immediately downstream of the Cheshire Lake dam continues to have high levels of bacteria. It is worth noting that the sampling at Farnums Causeway found very low levels flowing from the middle basin of the Lake into the north basin. Also, the levels at Cheshire Harbor were generally within the desired limits, indicating that the river appears to have recovered to some degree during its journey through the wetlands known as “the Jungle”.

The other primary area of concern is the Marshall St, bridge location. The next sample site upstream at Hudson Brook was well below the thresholds. Thus it would appear that there is a definite need to sample between those locations to help identify the source or sources of contamination. Also, from observations of the sample collectors, it appears that the volume of water in the river at Marshall St. is much less than at Hudson Brook, something that should be checked with direct measurements.

Concerns about non-point source pollution suggest the need for more information on water quality during and immediately after storm events. The 2001 monitoring season was considerably drier than the 2000 season, and thus the one “wet weather” sample does not provide a strong basis for drawing conclusions.

As we continue to increase our information base on the Hoosic River, we will try to more finely focus our monitoring efforts toward the locations and times most likely to be of significance for threats to water quality.

Acknowledgements

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