

Volunteer Monitoring Program

2001

Water Quality Report

for:

River Section: (4) Squannacook River and Tributaries. This section includes the Squannacook River and Mason and Walker Brooks.

Description: The Squannacook River begins at the confluence of Mason and Willard Brooks in West Townsend. Mason and Walker brooks are tributaries located in south-central New Hampshire. They and Willard Brook in Ashby, MA flow through mostly forested lands with little residential or commercial development within their respective drainages. The headwaters of these streams are considered to be "outstanding resource waters". The Squannacook in West Townsend flows past several active agricultural fields and pastures, then parallel to the more developed Rte. 119 corridor in Townsend and into Harbor Pond.

The Squannacook is buffered on both sides by forested land as it flows through the Squannacook-Bertozzi Wildlife Management Area. Hollingsworth and Vose Co., a paper mill that produces specialized paper products is located on the Squannacook in West Groton. Hollingsworth and Vose maintains a dam and has a small treatment plant that discharges to the river. The river forms the border between Shirley and Groton; the Groton Town Forest borders the river to the north until it joins the Nashua River near Route 2A.

Site	Water Body, Town	Field Description of Site Location
WB01-01	Walker Brook, Mason, NH	Upstream side of Walker Brook Rd.
MB01-01	Mason Brook, Mason, NH	.01 mile upstream fro Jed's Lane off rte. 123.
MB02-01	Mason Brook, Mason, NH	Downstream of Jed's Lane.
SQ01-01	Squannacook River, West Groton, MA	Downstream of Harbor Pond dam, Townsend.

Assessment:

Biology

Coliform Bacteria - Mason and Walker Brook samples were analyzed for E.coli, because the sampling sites are in New Hampshire, and E.coli is the bacterial standard in New Hampshire. The New Hampshire state standard for E. coli for swimming beaches is 88 per 100 milliliter in any one sample, or not over 47 for a three sample average over a 60-day period. Other recreational waters should not have greater than 406 E.coli/100ml. Although the geometric means for all sites in this section fall well within the NH state standard, in May as sample from Walker Brook (WB-01-01) contained 120 colonies/100ml. The three month average was well below the standard, however.

The Squannacook site was not sampled until June, and was not sampled in August. The geometric mean of the remaining four sets of samples was 45 col./100 mls, well below the MA state standard o 200 col./100 mls. These results are consistent with past years' results.

Chemistry

pH - pH values for Mason Brook were slightly below the MA state acceptable range of 6.5 to 8 standard units. The geometric mean for the two sampling sites were 6.2 and 6.3. The low pH values are consistent with past years' data, and are most likely influenced by the underlying bedrock in the stream. The geometric mean for pH from the Walker Brook samples falls just above the range at 6.7 standard units.

The pH values for the Squannacook River yielded a geometric mean of 6.8 standard units, within the acceptable range of 6.5 to 8.0.

Alkalinity - Low (<10mg/l CaCO₃) geometric means at all sites in this section indicate only minimal buffering capacity in the water. Sandy soil and schist bedrock contribute little to the alkalinity here.

Dissolved Oxygen - Mason Brook did not meet the required percent saturation level required for a cold water fisheries. This is most likely due to natural conditions relating to low flow. However, the temperature in the stream never exceeded 20°C.

The sites on the Squannacook River and Walker Brook met the requirements for a cold water fisheries.

Physical

Temperature - All sites demonstrate support o coldwater fisheries (<20°C) based on seasonal means. However, the Squannacook site exceeded 20°C in June and July, which could threaten the cold water fisheries status. The warmer temperatures probably have to do with the warmer waters flowing from Harbor Pond in mid-summer.

Standards Compliance:

Data from each site within the section are compared with Massachusetts (or New Hampshire) **class B** water quality standards. For each parameter the geometric mean of seasonal results is used.

Site	Dissolved Oxygen	Fecal Coliform	pH	Temperature
WB01-01	Yes	Yes	Yes	Yes
MB01-01	No	Yes	No	Yes
MB-01-01	No	Yes	No	Yes
SQ01-01	Yes	Yes	Yes	Yes*

(note: Yes = supports uses outlined; No = does not support uses outlined)

*The geometric mean for temperature is below the required 20°C , but the temperatures exceeded 20°C in the summer months.

Summary: The results from Walker Brook and Squannacook River sampling indicate the water quality supports cold water fisheries, and fecal coliform and E.coli results were not above the respective states' standards (Massachusetts and New Hampshire). Mason Brook did not meet the criteria for cold water fisheries, probably due to periods of low flow. The values for pH and alkalinity also are very low for Mason Brook, and are borderline for Walker Brook and the Squannacook River. These values are most likely due to natural background conditions.

The temperature in the Squannacook was above 20°C in the summer months, and could potentially threaten its cold water fisheries status. The residence time of the water in Harbor Pond most likely contributes to the increased temperatures.

Recommended Actions:

- ◆ Determine what other areas in the Squannacook River watershed should be monitored for water quality. The DEP will be determining if the Squannacook River in the reach below Harbor Pond supports cold water fisheries. Continue to monitor below Harbor Pond.