

# Volunteer Monitoring Program

2001

## Water Quality Report

for:

**River Section: (1) Lower Nashua River.** Section includes Nashua River main stem from the mouth upstream to Pepperell, MA and Reedy Meadow Brook in Pepperell.

**Description:** This section starts at the mouth of the river where it flows into the Merrimack River in Nashua, NH. The river maintains a good flow rate until it deepens and slows near its mouth. The urbanization in and around the city of Nashua has some influence on the water quality for the lowest stretch of river.

One Nashua site is located at Mine Falls Park. Sites in the upstream portion of this river section include one at the Route 111 bridge in Hollis, NH where the river is rather wide but shallow and contains some significant rapids. It continues upstream to Pepperell, MA where the river receives effluent treated by the Pepperell Wastewater Treatment Plant. Much of this area is wooded or open land with some significant development. Other sampling sites are located in Pepperell - one near the mouth of the Nissitissit River and one at the covered bridge a few hundred yards from the dam that forms Pepperell Pond. Starting in August, samples were collected from Reedy Meadow Brook in Pepperell, which flows into the Nashua River just north of the Nissitissit confluence. The samples were collected in response to a concerned neighbor who witnessed many children playing in the stream in early and mid-summer.

The Nashua River in this section is considered a warm water fishery. Warm water fisheries must have a dissolved oxygen level of not less than 5.0 mg/l, or a D.O. saturation level of at least 60 percent. Temperatures in these waters must not exceed 28.3 degrees.

Site	Water Body, Town	Field Description of Site Location
NM01	Nashua River, Nashua, NH	800 ft. upstream from mouth of river.
NM02	Nashua River, Nashua, NH	Mine Falls Park at boat launch.
NM03	Nashua River, Hollis, NH	Upstream side of Rte. 111 bridge river left.
NM04	Nashua River, Pepperell, MA	Opposite and upstream from Nissitissit River confluence.
NM05	Nashua River, Pepperell, MA	Upstream side of the covered bridge.
RMB01-01	Reedy Meadow Brook, Pepperell, MA	Upstream side of Shawnee Road

## Assessment:

### Biology

Coliform Bacteria - The covered bridge site is the only site that exceeded a geometric mean of 200 organisms per 100 ml for fecal coliform. The geometric mean of the samples is 358 organisms per 100 ml for the eight samples analyzed. This includes one result from the July sampling event that contained 15,000 organisms per 100 ml. New Hampshire sites are analyzed only for Escheria Coli (E. Coli), because this is the New Hampshire Department of Environmental Services' (NHDES) state criteria for bacteria. All sites are otherwise within the state standard for class B waters.

Though there is little opportunity for direct human contact at the covered bridge site, the problem is consistent and merits continued attention and attempts at corrective action.

## Chemistry

pH - All sites had a seasonal pH value of 7.1, except the covered bridge site which had a mean value of 7.2. All are within acceptable ranges.

Dissolved Oxygen - Dissolved oxygen levels met the MA state standard for cold water fisheries at all sites, with the exception of September results from the Nashua mainstem at the following locations: the river mouth; Mine Falls Park; the Rt. 111 bridge in Hollis and at the Nissitissit confluence. The lower dissolved oxygen levels are likely the result of a combined effect of low water levels and an excess of weed growth, as noted by volunteers on Field Data Sheets.

Alkalinity (as CaCO<sub>3</sub>) - Alkalinity as measured as calcium carbonate (mg/l CaCO<sub>3</sub>), is also referred to as acid neutralizing capacity. All sites on the Nashua were measured between 24 to 27 mg/l CaCO<sub>3</sub>. These results indicate the sites are well buffered.

## Physical

Temperature - Seasonal means at all sites support warmwater fisheries.

### 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
NM01-01	Yes	Yes	Yes	Yes
NM02-01	Yes	Yes	Yes	Yes
NM03-01	Yes	Yes	Yes	Yes
NM04-01	Yes	Yes	Yes	Yes
NM05-01	Yes	<b>No</b>	Yes	Yes
RMB-01-01	Yes	Yes	Yes	Yes

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

**Summary:** Water quality in this section is relatively good, at least by the parameters measured in this program. Improvements in fecal coliform levels over last year probably reflect the annual variances in rainfall and temperatures as much as anything else.

The covered bridge site in Pepperell had three events with significantly elevated fecal coliform levels. Sampling data from 2000 collected from Varnum Brook, upstream of the Pepperell Paper Co. did not indicate Varnum Brook as a likely source of the bacteria. A possible source is Klebsiella bacteria carried in the wastewater from Pepperell Paper Co., and that may look like fecal coliform in the bacterial augers. Further investigation is necessary to confirm this. The discharge permit for Pepperell Paper Co. is due for renewal. The NRWA plans to comment on the draft permit when it is issued.

### Recommended Actions:

- ◆ Determine what bacteria are present in samples collected at the covered bridge site.