

Blackstone River Coalition
Watershed-wide Volunteer Water Quality Monitoring Program
2004 Monitoring Season Report Card Summary

- Over 70 volunteers monitor 83 sites on the second Saturday of the month from April to November. Volunteers test for dissolved oxygen and record air and water temperatures at their sites. Samples are taken to one of the three satellite labs where measurements for pH, turbidity, orthophosphate, and nitrate are taken. The satellite labs are run by one of three regional field coordinators.
- The watershed is divided into three regions. The Blackstone Headwater Coalition covers the headwaters. The Blackstone River Watershed Association covers the midreach, and the Blackstone River Watershed Council covers the southern end of the watershed.
- Monthly raw data is color coded by parameter according to guidance provided by MA DEP. Each site is graded on the following three categories: aesthetics, chemical and nutrients. The aesthetics grade includes turbidity, water appearance, water odor and visual assessment of turbidity. The chemical grade includes dissolved oxygen and water temperature. The nutrient grade includes nitrate and orthophosphate.

SEE FOLLOWING PAGES FOR DETAILED PROCEDURE FOR CREATING THE REPORT CARD

Conclusions:

- As expected the nutrient (nitrate and orthophosphate) category contained the most red (poor) and orange (fair) grades. The report card shows the majority of the Headwater Tributaries had grades of red (poor) or orange (fair). All sites on the mainstem received a red (poor) grade. None of the tributary sites in the midreach and southern part of the watershed received a red (poor) grade.
- Chemical – Twelve sites received a red (poor) grade. The majority of those only experienced one or two low dissolved oxygen levels, which occurred during July, August and September.
- The 2004 season provided us with our first year of complete watershed-wide baseline data. U.S. EPA, MA DEP and RI DEM also approved a Quality Assurance Project Plan for the program.

Future Actions:

- During the 2005 season we will be able to use the 2004 baseline data to screen for “hot spots” and identify trends. Based on this information we will target the most egregious “hot spots” requiring immediate attention.
- A pilot for bacteria testing was conducted using the Colilert system. Testing includes total coliform and E. coli. During the 2005 season we will target specific reaches in each of the three regions that are identified as having high bacteria counts.

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Watershed-wide Volunteer Water Quality Monitoring Program
Procedure for Developing 2004 Monitoring Season Report Card

1. Samples are collected and tested on the second Saturday of the month from April to November. Sites must be sampled at least 6 times out of 8 possible monitoring events. Monthly raw data is color coded by parameter according to guidance provided by MA DEP. See chart below.

Category/Indicator	Units	Excellent <i>green</i>	Good <i>yellow</i>	Fair <i>orange</i>	Poor <i>red</i>
AESTHETICS					
Turbidity	NTU	0-1	greater than 1, less than 5	5 - 50	>50
CHEMICAL					
Dissolved Oxygen	Cold water	>9 mg/l	>6 – 9 mg/l	5 – 6 mg/l	<5 mg/l
	Warm water	>6.5 mg/l	> 5 – 6.5 mg/l	4 – 5 mg/l	<4 mg/l
Temperature	Cold water	< 15°C (<59°F)	15°C - <20°C (59°F - <68°F)	20°C – 24°C (68°F – 75.5°F)	>24°C (>75.2°F)
	Warm water	< 24°C (<75.2°F)	24°C - <27°C (75.2° - <80.6°F)	27°C – 28.6°C (80.6°F – 83°F)	>28.6°C (>83°F)
NUTRIENTS					
Orthophosphate as P	mg/l	<.025	.025 - <.05	.05 - .1	>.1
Nitrate as N	mg/l	<0.3	0.3 - <.6	0.6 – 0.9	>0.9

Adapted from: MA DEP's SMART Monitoring Watershed Report Card Criteria, Kimball, Warren.2005.unpublished. DEP, Worcester.

2. Parameters are grouped into the following three categories: aesthetics, chemical and nutrients
 - aesthetics includes the following measurements: turbidity, water appearance, water odor and visual assessment of turbidity as well as knowledge of the site
 - chemical includes the following parameters: dissolved oxygen and water temperature
 - nutrients includes the following parameters: nitrate and orthophosphate

3. The report card includes an overall grade for each category (for each site monitored)
- aesthetics
 - using best professional judgment all four measurements are assessed to determine an overall grade. This is the most subjective category.
 - chemical
 - if one or more monitoring event includes a DO grade in the red (poor), the site receives a red (poor) overall grade
 - if one or more monitoring event includes a DO grade in the orange (fair), the site receives an orange (fair) overall grade
 - if one or more monitoring event includes a DO grade in the yellow (good), the site receives a yellow (good) overall grade
 - if every monitoring event results in a DO grade in the green (excellent), the site receives a green (excellent) overall grade
 - nutrients
 - averages are calculated for both nitrate (as nitrogen) and orthophosphate (as phosphorous)
 - overall site grades are assigned primarily based on the phosphorous average, due to phosphorous being the limiting nutrient in fresh water.
 - if the average phosphorous grade falls into the orange (fair) or yellow (good) category, but more than one monitoring event has a phosphorous red (poor) rating (excluding wet weather events*), the site is given an overall grade of red (poor)

** August and November were considered wet weather events*

4. Report card includes the following notations
- *cwf indicates designated cold water fishery, which means cold water standards for DO and water temperature were used
 - ** in the # of sampling events/no flow conditions column indicates the site experienced no flow conditions during one or more sampling events

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