

Maine Department of Environmental Protection
Trout Brook: Water Quality and Next Steps¹
February 9, 2010

1. Overview of Trout Brook's Water Quality Monitoring

- a. **Impairment Status** - Trout Brook is currently listed as an Urban Impaired Stream and does not meet Class C water quality standards due to lack of pollution intolerant aquatic macroinvertebrates (bugs) and low dissolved oxygen levels (DO).
- b. **Fishery** – The stream has an incredible fishery that includes sea-run trout and eels. Leon Tsomides, the head of DEP's biomonitoring section, said he has observed lots of fish during his sampling.
- c. **Macroinvertebrates** - Leon said that his staff has collected bug data at two stations on Trout Brook.
 - Station 1 (at Cottage Rd) – This station was impacted by high tides and salt water intrusion, which affected bug populations (70% amphipods). They stopped sampling here as a result.
 - Station 2 (near Boothby Ave) – This station was sampled last in 2005. They expected to see better macroinvertebrate populations, but it was mostly midges and beetles that are usually found in disturbed areas. There were no stoneflies or mayflies and just a few caddisflies.
 - Station 3 (Route 77, next to church) – Leon tried to sample here in the past, but low flows prevented them from putting out rock bags.
 - **Conclusions** - Trout Brook has very poor reproductive capacity for aquatic critters. Critters can't migrate into upstream areas since the populations are limited by the saltwater conditions below Ocean Street. Also, bug populations living in the stream don't have much riparian zone for mating. Low flows in upper sections of the stream are also a limiting factor.
- d. **Wetland Monitoring** – The DEP has collected wetland data on one site in the watershed. The wetland data doesn't look good; however, a CSO has been removed since the last monitoring.
- e. **Specific Conductivity and Nutrients** – Nutrient levels and conductivity (ranging from 586 to 831) are relatively high.
- f. **Dissolved Oxygen** – Dissolved oxygen looks low in the upper part of the watershed. It looks like it could be associated with groundwater inputs, but it could be a BOD issue.
- g. **Pesticides** - Henry said that MBPC and Friends of Casco Bay collected sediment samples on Trout Brook at the Boothby road crossing. They are analyzing the samples for pesticides commonly used by homeowners.
- h. **Kimball Brook** – Kimball Brook joins Trout Brook at Cottage Road. Kimball has had two biomonitoring sites (one above the ponds and one @ Rte. 77). The stream has problems similar to Trout Brook with poor chances of bug recolonization and lots of iron bacteria.

2. Watershed NPS Sources and Other Possible Problems

- **Overview** - Trout Brook's problems are caused by inadequate riparian buffer (which allows inputs from commercial fertilizers/insecticides, increases temperature, and limits the terrestrial habitat for mating insects that will then populate the stream), low base flow (which may be occurring due to stream widening in several places and a relatively high percentage of impervious cover), and low DO inputs from groundwater (and possibly nutrients). The suspected impairment sources are the farm at the top of the brook and the dense residential area in the mid-lower sections of the brook.

¹ Excerpted from conference call between officials from the DEP, Maine Board of Pesticides Control and City of South Portland

- **Restoration Priorities** – Numerous NPS sites were identified in the Trout Brook Watershed Survey and Cape Elizabeth’s Compensation Fee Utilization Plan (2008). Meeting participants felt the following work would provide the biggest payoffs for the stream.
 - **Riparian buffers** – Past studies showed that ~40% of Trout Brook’s riparian corridor did not have a riparian buffer. Buffers are key to the restoration of Trout Brook’s macroinvertebrate community and could/should start as soon as possible.
 - **Maxwell’s Farm** – Maxwell’s Farm is likely contributing to problems on Trout Brook. A few people thought that the Maxwells would be open to establishing buffers and discussing other BMPs for their farm.

3. Conclusions

- **Stream Condition and Restoration Potential**

- Leon’s summary of biomonitoring assessments and the subsequent discussion helped answer many of the groups’ questions about Trout Brook. There was general consensus that existing data tells us a good deal about stream conditions and that it makes sense to move ahead with watershed planning and restoration efforts. The City removed a CSO from the watershed in 2006, so the stream has probably benefited from this as well.
- Riparian area restoration and farm BMPs would provide significant benefits in restoring the stream’s bug population. Behavior change (similar to efforts on Capisic Brook) is needed in the residential areas.
- If the dissolved oxygen problems are due to groundwater inputs, it could be improved by aerating the stream in this area (i.e., increasing DO). This could be achieved by adding cascades and woody debris to churn up the water and narrowing the channel to increase velocity.

- **Additional Monitoring Needs**

- **Dissolved Oxygen** – It would be very useful to collect more information about Trout Brook’s dissolved oxygen. It appears that the DO problem is associated with groundwater from the wetlands, but this should be confirmed. If the problem is associated with groundwater, diurnal differences would not be expected.
- **Periphyton monitoring** – Most people familiar with the stream had never noticed periphyton problems in Trout Brook, even in unshaded sections. However, periphyton monitoring in Trout Brook would help identify the extent of potential eutrophication/nutrient issues in the stream.
- **Macroinvertebrate monitoring in Cape Elizabeth** – Since low flows prevented the use of rock bags near the church at Rte 77, we don’t have a good sense about the stream condition at this point. It would be good to collect bug data here, either using rock bags or kick nets (looking for sensitive taxa). This would help us assess how much the farm (and the area above it) impact the stream.