EPA
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Environmental Protection
Agency

Total Maximum Daily Loads
TMDLs at Work in Connecticut

Many Pollutants, One Target

Innovative TMDL Focuses on Impervious Cover to Address Stormwater Impacts in the Eagleville Brook Watershed

Like many urban watersheds, the Eagleville Brook watershed in eastern Connecticut is characterized by a mosaic of hard surfaces, such as parking lots and rooftops, that do not allow rain to infiltrate. Traveling over these impervious surfaces, large volumes of rapidly moving stormwater can carry a complex array of pollutants and cause other problems, such as streambank erosion and flooding. As shown in Figure 1, urban areas surround the headwaters of Eagleville Brook, including the University of Connecticut (UConn) and the Town of Mansfield, Eagleville Brook demonstrated water quality problems associated with stormwater runoff from urban impervious surfaces. The Connecticut Department of Environmental Protection (DEP) conducted surveys of fish and macroinvertebrate communities. Figure 2 shows how excessive sedimentation from stormwater runoff can degrade aquatic habitat. From these surveys, DEP concluded that Eagleville Brook did not meet the aquatic life designated use in Connecticut's water quality standards and required a TMDL. Studies by DEP across small Connecticut watersheds indicate that as little as 11 percent impervious surface has the potential to affect the speed, the timing, and the quality of runoff to a stream. Parts of the brook's watershed exceed 25 percent impervious surface.

To address the aquatic life impairment, DEP developed an innovative TMDL for Eagleville Brook. Rather than identifying reductions in specific pollutants, the Eagleville Brook TMDL establishes a target percentage of impervious cover (IC) for the watershed. Although IC is not the direct factor causing the impairment, it is a good indirect, or surrogate, measure because of the relationship between impervious surfaces and stormwater-related water quality problems. As stated in the final TMDL report, the goal of the TMDL is to reduce the effects of stormwater on aquatic life in Eagleville Brook. Therefore, future evaluation of the effectiveness of the TMDL will focus on the health of aquatic life in Eagleville Brook—not on measuring reductions in impervious cover in the watershed.

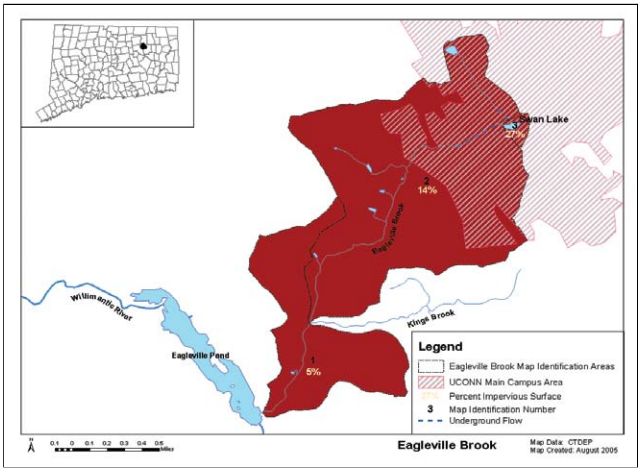

Figure 1. Location of the Eagleville Brook watershed.

TMDL at a Glance

Eagleville Brook Impervious Cover (IC) TMDL

(approved March 2007)

www.ct.gov/dep/lib/dep/water/tmdl/tmdl_final/eaglevillefinal.pdf

- **Factors causing impairment**
  Aquatic life designated uses impaired due to a complex array of pollutants transported by stormwater
- **Sources contributing to impairment**
  Urban storm water runoff from impervious surfaces. Impervious cover used as surrogate to address mix of pollutants and other stressors conveyed by storm water
- **Restoration options**
  Reduce and disconnect impervious cover where practical; minimize additional disturbance; install engineered best management practices to reduce effects of impervious coveron receiving waters
- **Stakeholder involvement**
  University of Connecticut, Town of Mansfield, Connecticut Department of Environmental Protection, Willimantic River Alliance, local businesses and watershed residents
- **Status of waterbody**
  Ongoing implementation
- **Benefits to stakeholders**
  Improved water quality and aquatic health, increased education, access to funding, and effective partnerships

What is a total maximum daily load (TMDL)?

It is a study or analysis that calculates the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. The TMDL establishes a pollutant budget and then allocates portions of the overall budget to the pollutant's sources. For more information on TMDLs, visit EPA's website at ***www.epa.gov/owow/tmdl***.

Figure 2. Excessive sedimentation is a contributing cause of degraded habitat in Eagleville Brook.

How are TMDLs at work in the Eagleville Brook watershed?

The Eagleville Brook IC TMDL established a framework for highlighting water quality concerns and developing workable solutions. DEP applied the stressor identification process to examine the relationship between impervious cover and the adverse effect on aquatic life. This process enabled stakeholders to see connections between land use actions and water quality.

Through the TMDL development process, DEP set a combined load allocation and wasteload allocation of 11 percent IC for Eagleville Brook. This target represents a recommended 12 percent IC threshold target and a margin of safety of 1 percent IC. The margin of safety is intended to account for uncertainty in the analysis.

What is the current status of Eagleville Brook as a result of the TMDL process?

With approval of the Eagleville Brook IC TMDL in March 2007, partners are just beginning to implement the TMDL. Over time, DEP will measure the aquatic diversity in Eagleville Brook to determine if implementation efforts are making progress toward restoring the brook's aquatic life designated uses. Although the ultimate measure of success is meeting the aquatic life designated uses, progress toward reducing impervious cover and mitigating impacts from stormwater runoff can also serve as an interim measure of TMDL implementation success.

How did local stakeholders benefit from the TMDL process?

Although it is too soon to measure the water quality benefits from implementing the TMDL, other benefits from the TMDL process include the following:

- **Increased stakeholder awareness and education.** Through the stressor identification analysis, stakeholders participating in the TMDL development process gained a better understanding of the connection between pollutant loads from impervious surfaces, the effects of stormwater volume and velocity from impervious surfaces, and changes to aquatic habitat and diversity.
- **Support for innovative stormwater management techniques.** The innovative approach to the Eagleville Brook TMDL translates to the consideration and piloting of innovative stormwater management techniques that fall under the umbrella of low impact design (LID). LID techniques under consideration in the Eagleville Brook watershed include green roofs and rain gardens. Through the mapping process, DEP and its partners will identify other potential locations for innovative stormwater management techniques and determine the associated cost-effectiveness of these approaches at priority locations.
- **Increased local stakeholder participation opportunities.** The Eagleville Brook IC TMDL process has fostered citizen involvement, such as participation in the streamwalk project sponsored by the Quinebaug-Shetucket Heritage Corridor Water Subcommittee.
- **Increased access to funding.** UConn and the Town of Mansfield are currently using Clean Water Act section 319 grant funding to create a watershed-based plan for the Eagleville Brook watershed that will assist with TMDL implementation. The total project cost is $349,731, with $200,000 in section 319 nonpoint source grant funding from DEP and $149,731 in matching funds from UConn. The project will identify opportunities for near-term BMP implementation, as well as document a general methodology by which other regulated communities and entities can address impervious cover-based TMDLs. In addition, UConn is implementing a green roof project at a science building on campus. This project has a total cost of $83,333,000, with $50,000 in section 319 nonpoint source grant funds from DEP and $33,333 in matching funds from UConn. DEP is providing an additional $25,687 for this project to support more water quality monitoring activities

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For more information on the Connecticut TMDL Program, visit
www.ct.gov/dep/cwp/view.asp?a=2719&q=325604&depNav_GID=1654

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