



TMDL Assessment Summary

Logan Brook

Watershed Description

This **TMDL** assessment summary applies to Logan Brook, a 0.96-mile stream located in the City of Auburn, Maine. The Logan Brook watershed begins in a forested area near Gracelawn Drive. The impaired segment of Logan Brook begins near the center of the watershed, near Mount Auburn Avenue. The stream flows south, crossing Damy Drive through an area characterized by developed open space. Logan Brook terminates near the intersection of Frenchs Lane and Whitney Street just west of the Androscoggin River. The Logan Brook watershed covers 166 acres in the City of Auburn.

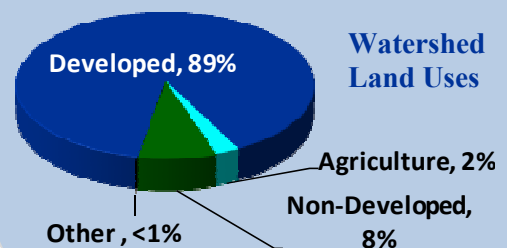
- Stormwater runoff from **impervious cover (IC)**, particularly in the developed area in the center of the watershed, is likely the largest source of pollution to Logan Brook. Stormwater falling on roads, roofs and parking lots in developed areas flows quickly off impervious surfaces, carrying dirt, oils, metals, and other pollutants, and sending high volumes of flow to the nearest section of the stream.
- The Logan Brook watershed is predominately developed (89%) characterized by high intensity development and developed open space. The watershed is 38% impervious.
- The Logan Brook watershed is only 8% non-developed. However, these small patches of woodland area within the watershed absorb and filter stormwater pollutants, and help protect both water quality in the stream and stream channel stability.
- Logan Brook is on to the list of Maine's Urban Impaired Streams (DEP, 2010).

Definitions

- **TMDL** is an acronym for **Total Maximum Daily Load**, representing the total amount of a pollutant that a water body can receive and still meet water quality standards.
- **Impervious cover** refers to landscape surfaces (e.g. roads, sidewalks, driveways, parking lots, and rooftops) that no longer absorb rain and may direct large volumes of stormwater runoff into the stream.

Waterbody Facts

- **Segment ID:**
ME0104000208_413R04
- **City:** Auburn, ME
- **County:** Androscoggin
- **Impaired Segment Length:** 0.96 miles
- **Classification:** Class B
- **Direct Watershed:** 0.26 mi² (166 acres)
- **Watershed Impervious Cover:** 38%
- **Major Drainage Basin:**
Lower Androscoggin River Watershed



Why is a TMDL Assessment Needed?

Logan Brook, a Class B freshwater stream, has been assessed by DEP as not meeting water quality standards for dissolved oxygen, recreational and aquatic life uses, and has been listed on the 303(d) list of impaired waters. The Clean Water Act requires that all 303(d)-listed waters undergo a TMDL assessment that describes the impairments and establishes a target to guide the measures needed to restore water quality. The goal is for all waterbodies to comply with state water quality standards.



*Tires and trash in Logan Brook.
(Photo: DEP Biomonitoring Program)*

Recreational impairments in Logan Brook have already been addressed in DEP's 2009 statewide bacteria TMDL [<http://www.maine.gov/dep/blwq/docmonitoring/TMDL/2009/report.pdf>]. The impervious cover TMDL assessment for Logan Brook addresses the remaining water quality impairments to dissolved oxygen and aquatic life use (stream habitat assessments). These impairments are associated with a variety of pollutants in urban stormwater as well as erosion, habitat loss and unstable stream banks caused by excessive amounts of runoff.

Sampling Results & Pollutant Sources

Logan Brook is too shallow for sampling of benthic-macroinvertebrates. The impairment is based on measurements of dissolved oxygen and stream habitat assessments.

Impervious Cover Analysis

Increasing the percentage of impervious cover (%IC) in a watershed is linked to decreasing stream health (CWP, 2003). Because Logan Brook's impairment is not caused by a single pollutant, %IC is used for this TMDL to represent the mix of pollutants and other impacts associated with excessive stormwater runoff. The Logan Brook watershed has an impervious surface area of **38%** (Figure 2). DEP has found that in order to support Class B aquatic life use, the Logan Brook watershed may require the characteristics of a watershed with **8%** impervious cover. This WLA & LA target is intended to guide the application of Best Management Practices (BMP) and Low Impact Development (LID) techniques to reduce the *impact* of impervious surfaces. Ultimate success of the TMDL will be Logan Brook's compliance with Maine's water quality criteria for dissolved oxygen and aquatic life.

*8% IC represents an approximate **79% reduction** in stormwater runoff volume and associated pollutants when compared to existing pollutant loads.*

Impervious Cover GIS Calculations

The Impervious Cover Calculations are based on analysis of GIS coverage's presented in Figure 1. The impervious area is derived from 2007 1 meter satellite imagery and the watershed boundary is an estimation based on contours and digital elevation models.

Next Steps

Because Logan Brook is an impaired water, stormwater runoff in the watershed should be considered during the development of a watershed management plan to:

- Encourage greater citizen involvement (e.g. through the Androscoggin River Watershed Council) to ensure the long term protection of Logan Brook;
- Address existing stormwater problems in the Logan Brook watershed by installing structural and applying non-structural best management practices (BMPs); and
- Prevent future degradation of Logan Brook through the development and/or strengthening of local stormwater control ordinances.

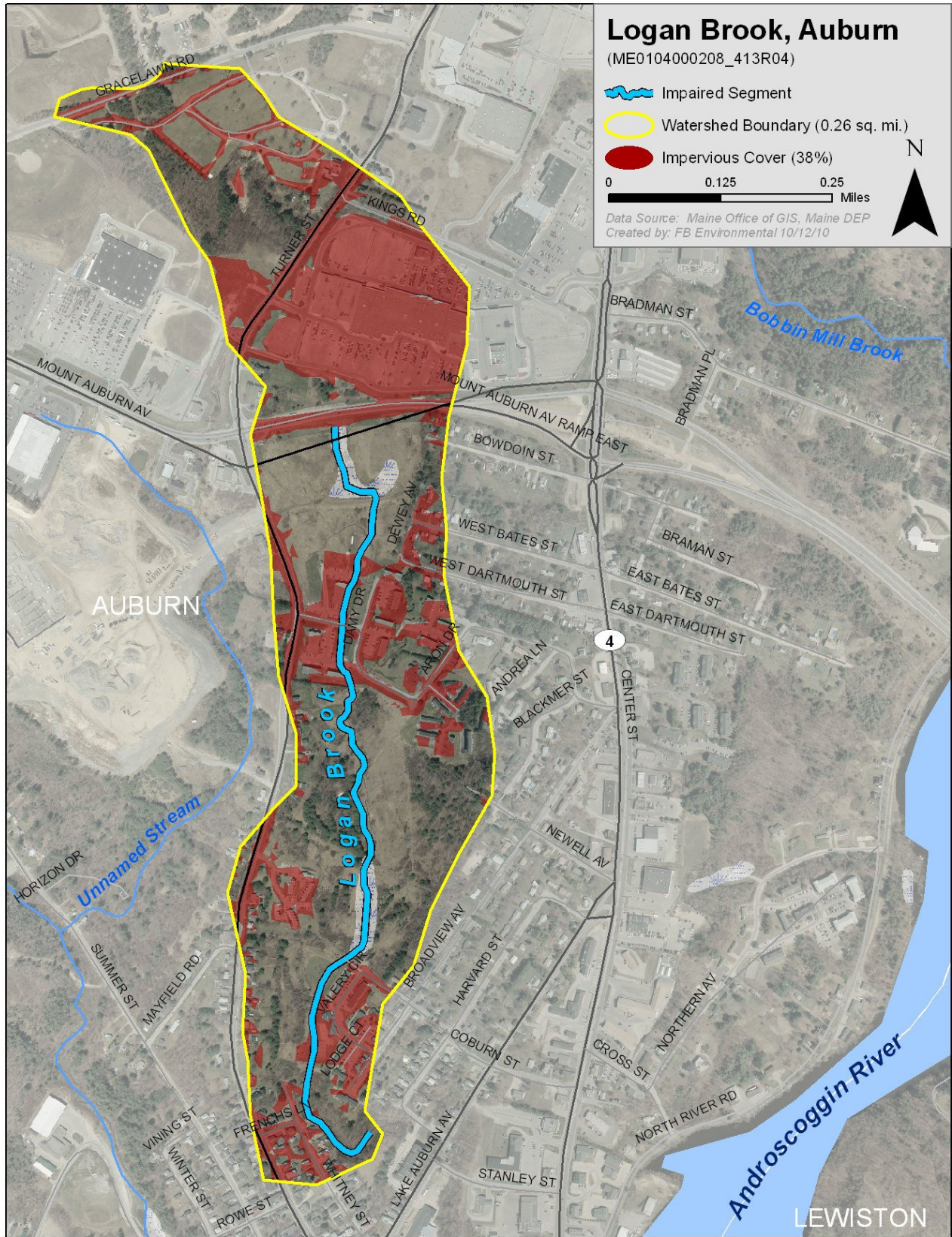


Figure 1: Map of Logan Brook watershed impervious cover.

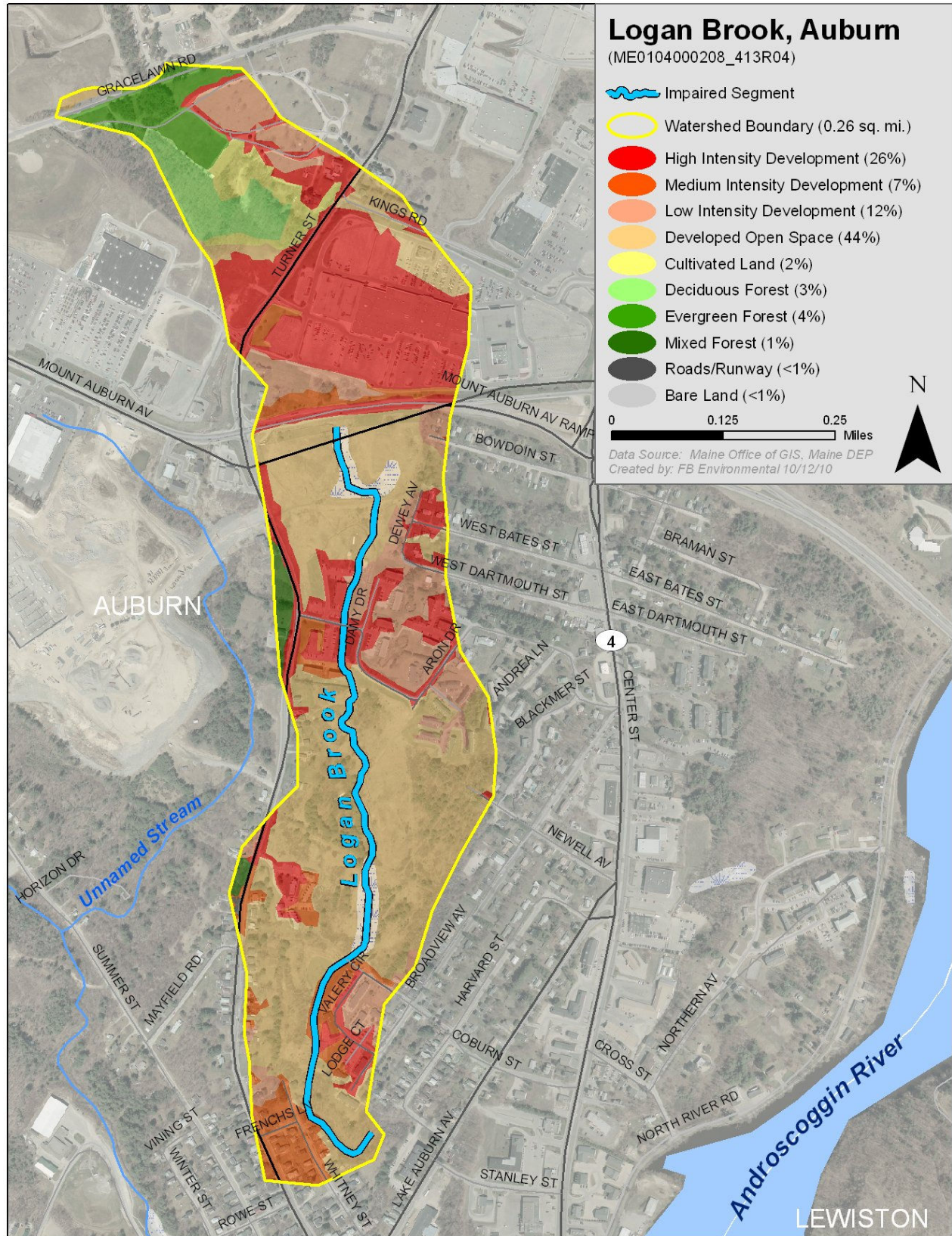


Figure 2: Map of Logan Brook watershed land cover.

References

- Center for Watershed Protection (CWP). 2003. Impacts of Impervious Cover on Aquatic Systems. Watershed Protection Research Monograph No. 1. Center for Watershed Protection, Ellicott City, MD. 142 pp.
- Davies, Susan P. and Leonidas Tsomides. 2002. Methods for Biological Sampling and Analysis of Maine's Rivers and Streams. Maine Department of Environmental Protection. Revised August, 2002. DEP LW0387-B2002.
- Maine Department of Environmental Protection (DEP). 2010. Assessment Database Detail Report for Logan Brook. Bureau of Land and Water Quality, Augusta, ME.