



TMDL Assessment Summary

Hart Brook, a.k.a. Dill Brook including Goff Bk.

Watershed Description

This **TMDL** assessment summary applies to a 4.15-mile section of Hart Brook (a.k.a. Dill Brook including Goff Bk.), located in the City of Lewiston, Maine. Hart Brook is a small stream in an important developing area just east of Lewiston's downtown. The stream begins near Lexington Street, in a medium to high-intensity developed area and follows Saratoga Street. Hart Brook then flows west and crosses the Maine Central Springfield Terminal Railroad where it joins with another small stream. The stream then crosses Route 95 before emptying into the Androscoggin River just south of Razel Way. The Hart Brook watershed covers 2,112 acres in the City of Lewiston, Maine.

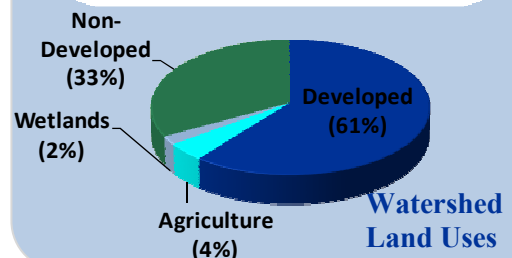
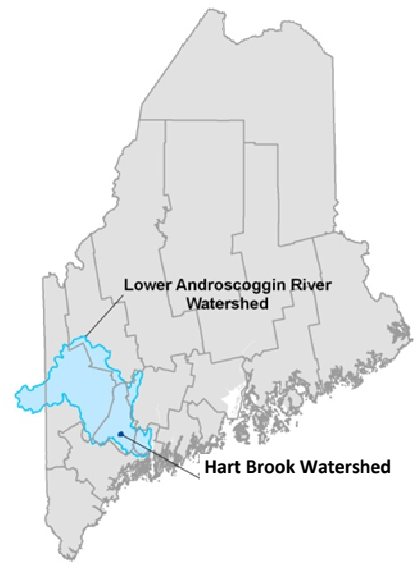
- Stormwater runoff from **impervious cover (IC)** is likely the largest source of pollution to Hart Brook. Stormwater falling on roads, roofs and parking lots in developed areas flows quickly off impervious surfaces, carrying dirt, oils, metals, and other pollutants, and sending high volumes of flow to the nearest section of the stream.
- The Hart Brook watershed is predominately developed (61%) and is characterized by medium to high-intensity development, particularly in the western portion of the watershed.
- The Hart Brook watershed is approximately 33% non-developed. Deciduous forests and other woodland areas within the watershed absorb and filter stormwater pollutants, and help protect both water quality in the stream and stream channel stability.

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:** ME0104000210_419R02
- **City:** Lewiston, ME
- **County:** Androscoggin
- **Impaired Segment Length:** 4.15 miles
- **Classification:** Class B
- **Direct Watershed:** 3.3 mi² (2,112 acres)
- **Watershed Impervious Cover:** 20%
- **Major Drainage Basin:** Lower Androscoggin River Watershed



Why is a TMDL Assessment Needed?

Hart Brook, a Class B freshwater stream, has been assessed by DEP as not meeting water quality standards for dissolved oxygen, recreational uses and aquatic life uses (benthic-macroinvertebrate, stream habitat, and nutrient/eutrophication assessments),-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.



*Hart Brook downstream of Station 341
(Photo: DEP Biomonitoring Program)*

Recreational impairments in Hart 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 Hart Brook addresses the remaining water quality impairments to dissolved oxygen and aquatic life use. 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 Station	Sample Date	Statutory Class	Model Results
341	8/18/1998	B	C
341	8/13/2003	B	NA
341	8/21/2008	B	I

Sampling Results & Pollutant Sources

Maine DEP makes aquatic life use determinations using a statistical model that incorporates 30 variables of data collected from rivers and streams, including the richness and abundance of streambed organisms, to determine the probability of a sample meeting Class A, B, or C conditions. Biologists use the model results and supporting information to

determine if samples comply with standards of the class assigned to the stream or river (Davies and Tsomides, 2002).

Hart Brook impairment is based on data collected by Maine DEP in the years 1998, 2003, and 2008 at a sampling station located below Goddard Road (341). Data collected at this station indicate Class B Hart Brook is attaining Class C conditions, is “non attaining” (NA), meaning it does not meet Class A, B, or C conditions, or is “indeterminate” (I), meaning too few organisms were collected to meet the minimum needed to statistically determine classification on different sample dates.

*8% IC represents an approximate **60% reduction** in stormwater runoff volume and associated pollutants when compared to existing pollutant loads.*

Impervious Cover Analysis

Increasing the percentage of impervious cover (%IC) in a watershed is linked to decreasing stream health (CWP, 2003). Because Hart 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

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.

excessive stormwater runoff. The Hart Brook watershed has an impervious surface area of **20%** (Figure 1). DEP has found that in order to support Class B aquatic life use, the Hart 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 Hart Brook's compliance with Maine's water quality criteria for aquatic life, primary contact recreation, and dissolved oxygen.

Next Steps

Because Hart 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 through the development of a watershed coalition to ensure the long term protection of Hart Brook;
- Implement the efforts described in the Hart Brook Watershed Action Plan (Woodard and Curran, 2007);
- Address existing stormwater problems in the Hart Brook watershed by installing structural and applying non-structural best management practices (BMPs); and
- Prevent future degradation of Hart Brook through the development and/or strengthening of local stormwater control ordinances.

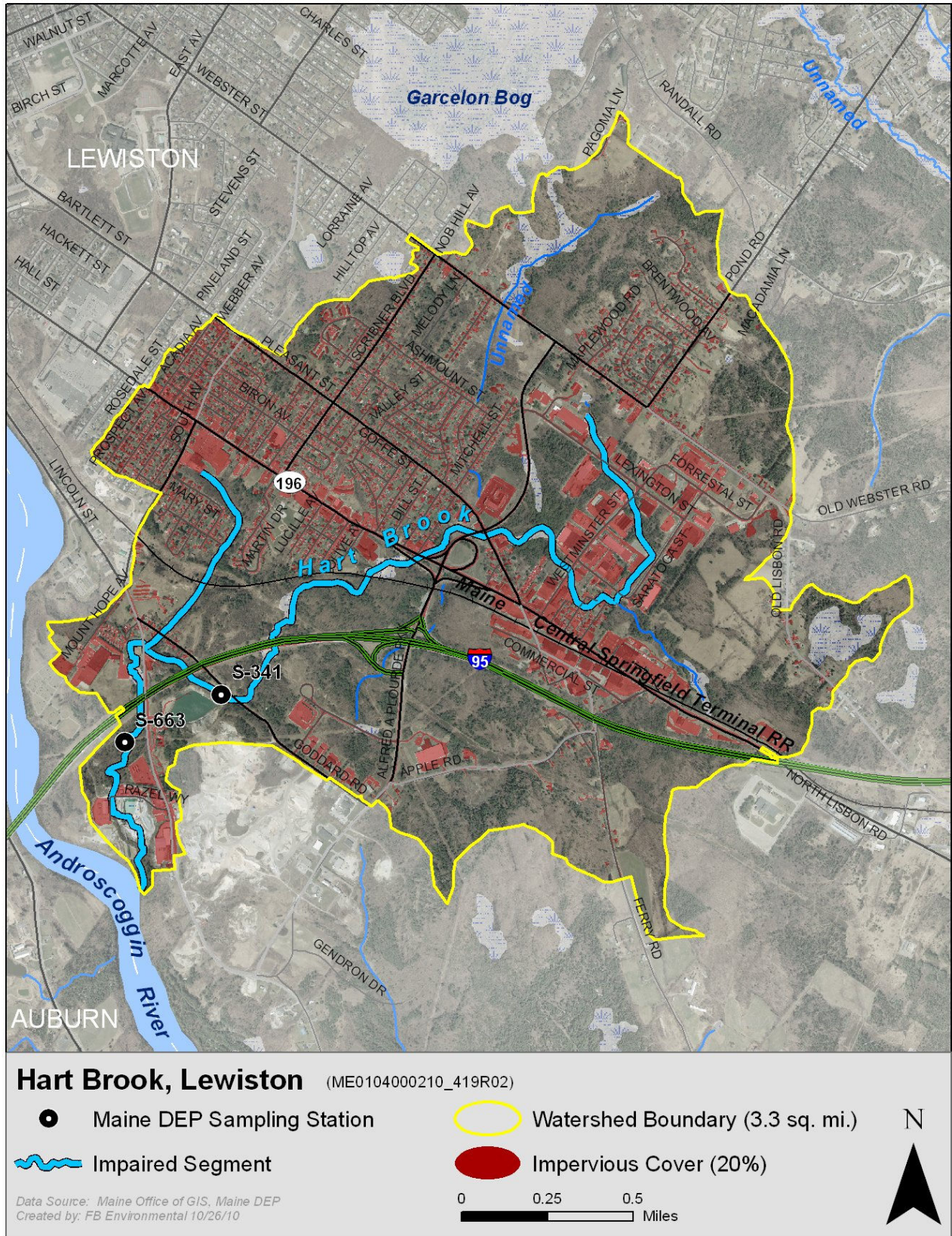


Figure 1: Map of Hart Brook watershed impervious cover.

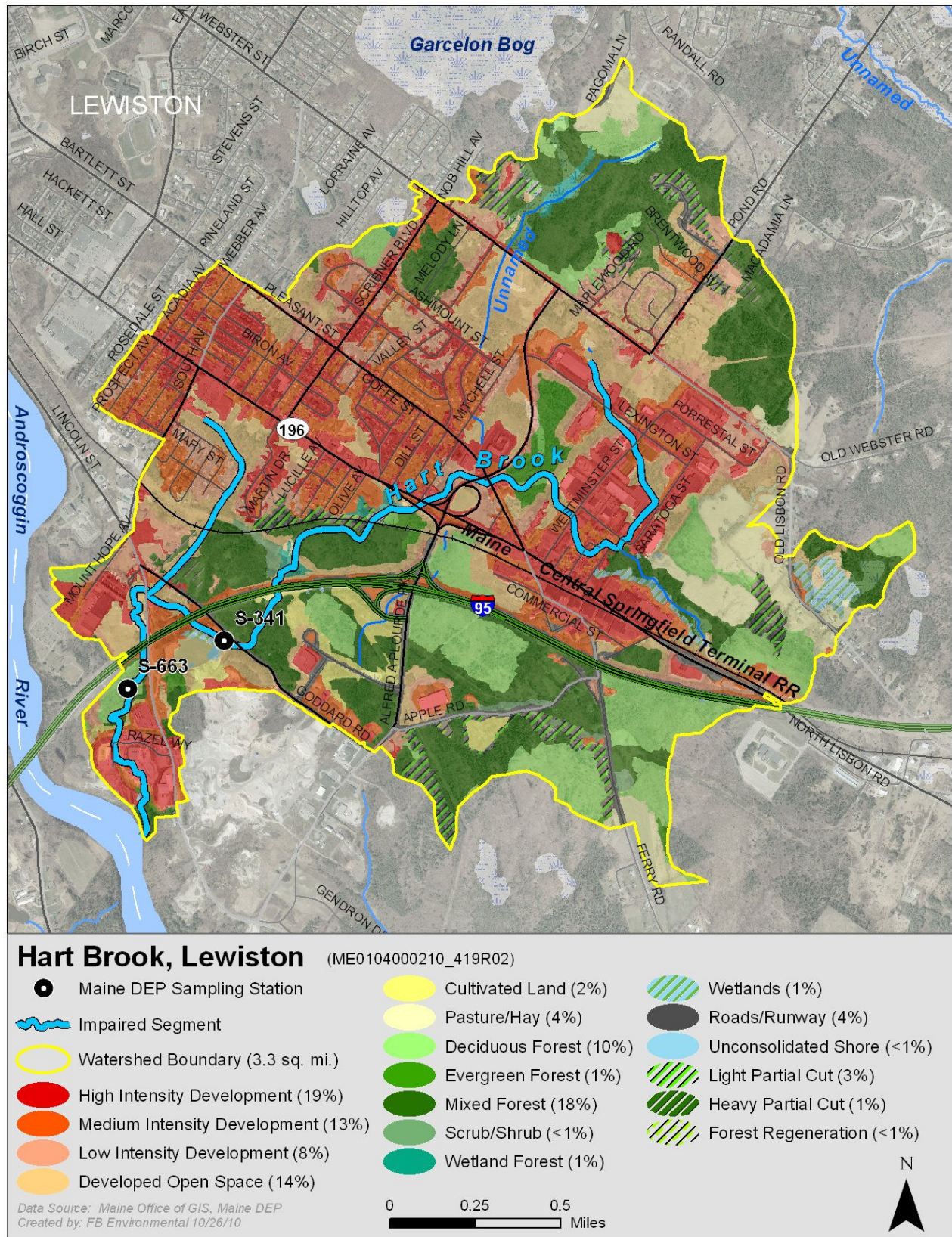


Figure 2: Map of Hart Brook watershed land cover.

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 Hart Brook. Bureau of Land and Water Quality, Augusta, ME.
- Woodard and Curran. 2007. Hart Brook Watershed Action Plan.
Online: <http://www.ci.lewiston.me.us/stormwater/hartbrook/index.htm>.