TMDLAssessment Summary

Capehart, a.k.a. Unnamed (Pushaw) Brook

Watershed Description

This **TMDL** assessment summary applies to the 0.46-mile Capehart, a.k.a. Unnamed (Pushaw) Brook, located in the City of Bangor, Maine. The Capehart Brook watershed is located just west of Kenduskeag Stream, and is bordered by Union Street to the south and Davis Road to the west. The impaired segment begins in the northeast corner of the watershed just below Finson Road. The stream flows northeast, parallel to Pushaw Road where it flows through a small forested area before emptying into Kenduskeag Stream. The Capehart Brook watershed covers 704 acres in the City of Bangor.

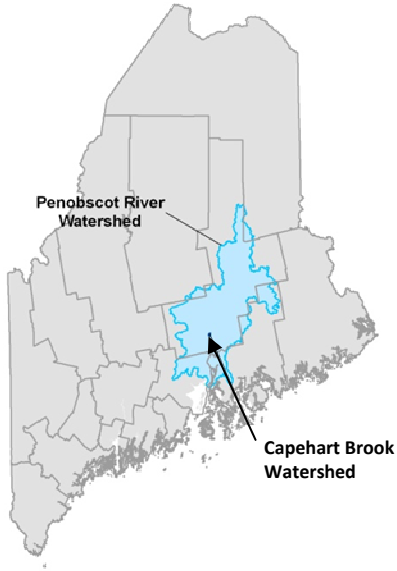
- Stormwater runoff from **impervious cover (IC),** particularly in the developed area in the center of the watershed, is likely the largest source of pollution to Capehart Brook. Stormwater falling on roads, roofs and parking lots in developed areas flows quickly off impervious surfaces, carrying dirt, oils, metals, and other pollutants, and sending high volumes of flow to the nearest section of the stream.
- Development in the Capehart Brook watershed is characterized by residential development and developed open space. The watershed is 15% impervious.
- The Capehart Brook watershed is 48% non-developed, particularly in the southern portion of the watershed. These woodland areas absorb and filter stormwater pollutants, and help protect both water quality in the stream and stream channel stability.
- Capehart Brook is on to the list of Maine's Urban Impaired Streams (DEP, 2010).

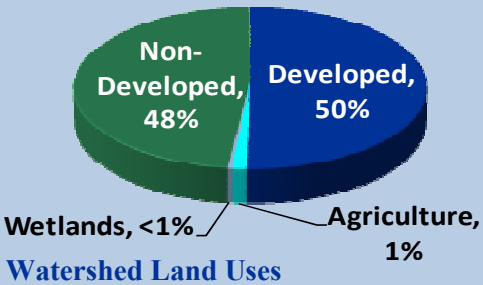
Definitions

- **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*

Waterbody Facts

- **Segment ID:** ME0102000510_224R05
- **City:** Bangor, ME
- **County:** Penobscot
- **Impaired Segment Length:** 0.46 miles
- **Classification:** Class B
- **Direct Watershed:** 1.1 mi^2 (704 acres)
- **Watershed Impervious Cover:** 15%
- **Major Drainage Basin:** Penobscot River Watershed





Watershed Land Uses

Why is a TMDL Assessment Needed?

Capehart Brook, a Class B freshwater stream, has been assessed by DEP as not meeting water quality standards for aquatic life use 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.

Capehart Brook upstream of Station 311.
(Photo: DEP Biomonitoring Program)

The impervious cover TMDL assessment for Capehart Brook addresses the water quality impairments to 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

Sampling Station	Sample Date	Statutory Class	Model Results
S-311	9/10/1997	B	NA
S-311	8/17/2001	B	I

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).

Benthic-macroinvertebrate data were collected by DEP in 1997 and 2001 at a sampling station located at the end of Pushaw Road (S-311). The most recent data collected at this station indicate Class B Capehart, a.k.a. Unnamed (Pushaw) Brook, is "indeterminate" (I), meaning too few organisms were collected to meet the minimum needed to statistically determine classification.

Impervious Cover Analysis

Increasing the percentage of impervious cover (%IC) in a watershed is linked to decreasing stream health (CWP, 2003). Because Capehart 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 Capehart Brook watershed has an impervious surface area of **15%** (Figure 1). DEP has found that in order to support Class B aquatic life use, the Capehart 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)

***8% IC** represents an approximate **47% 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. In Capehart Stream 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.

techniques to reduce the *impact* of impervious surfaces. Ultimate success of the TMDL will be Capehart Brook's compliance with Maine's water quality criteria for aquatic life.

Next Steps

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

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

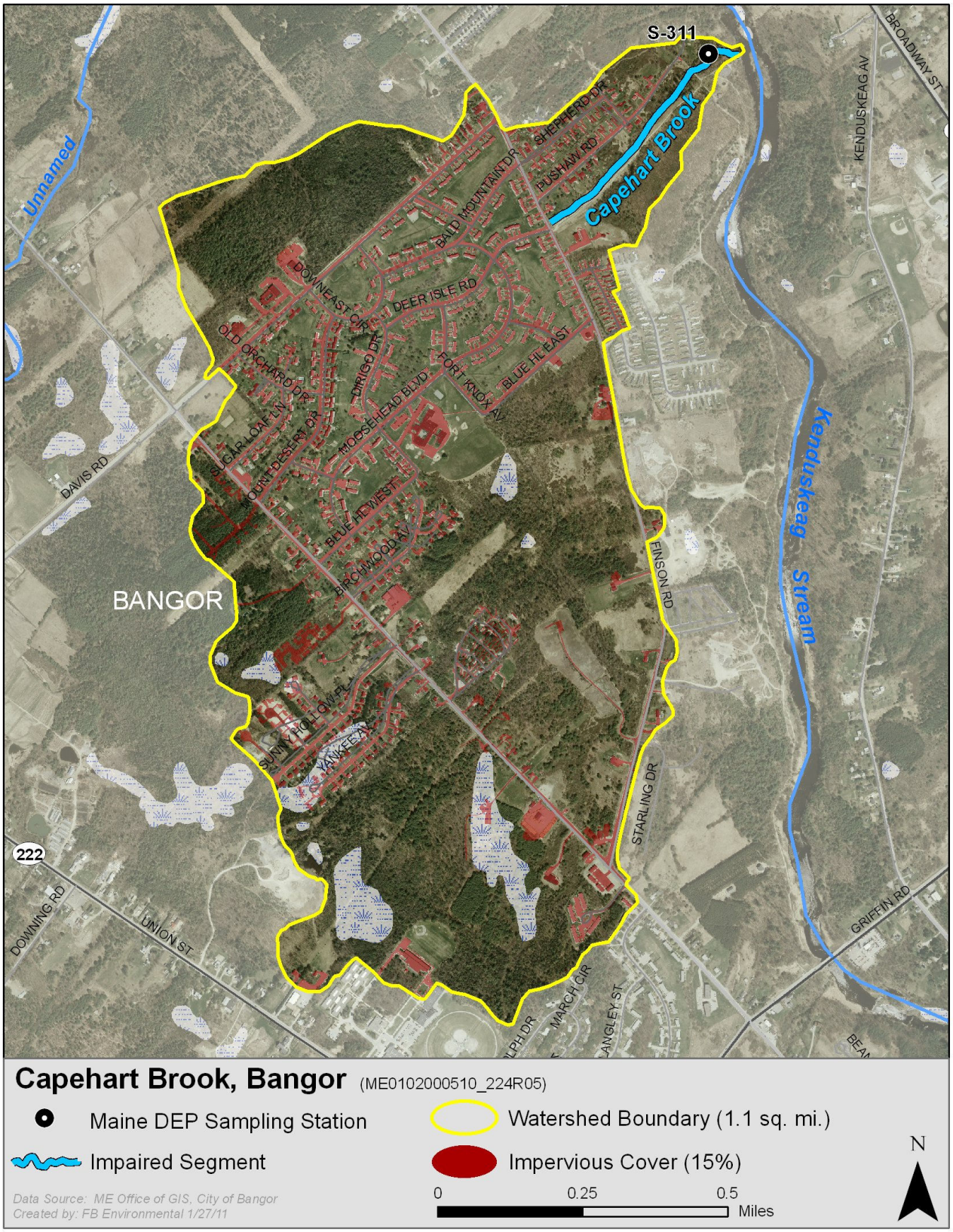


Figure 1: *Map of Capehart Brook watershed impervious cover.*

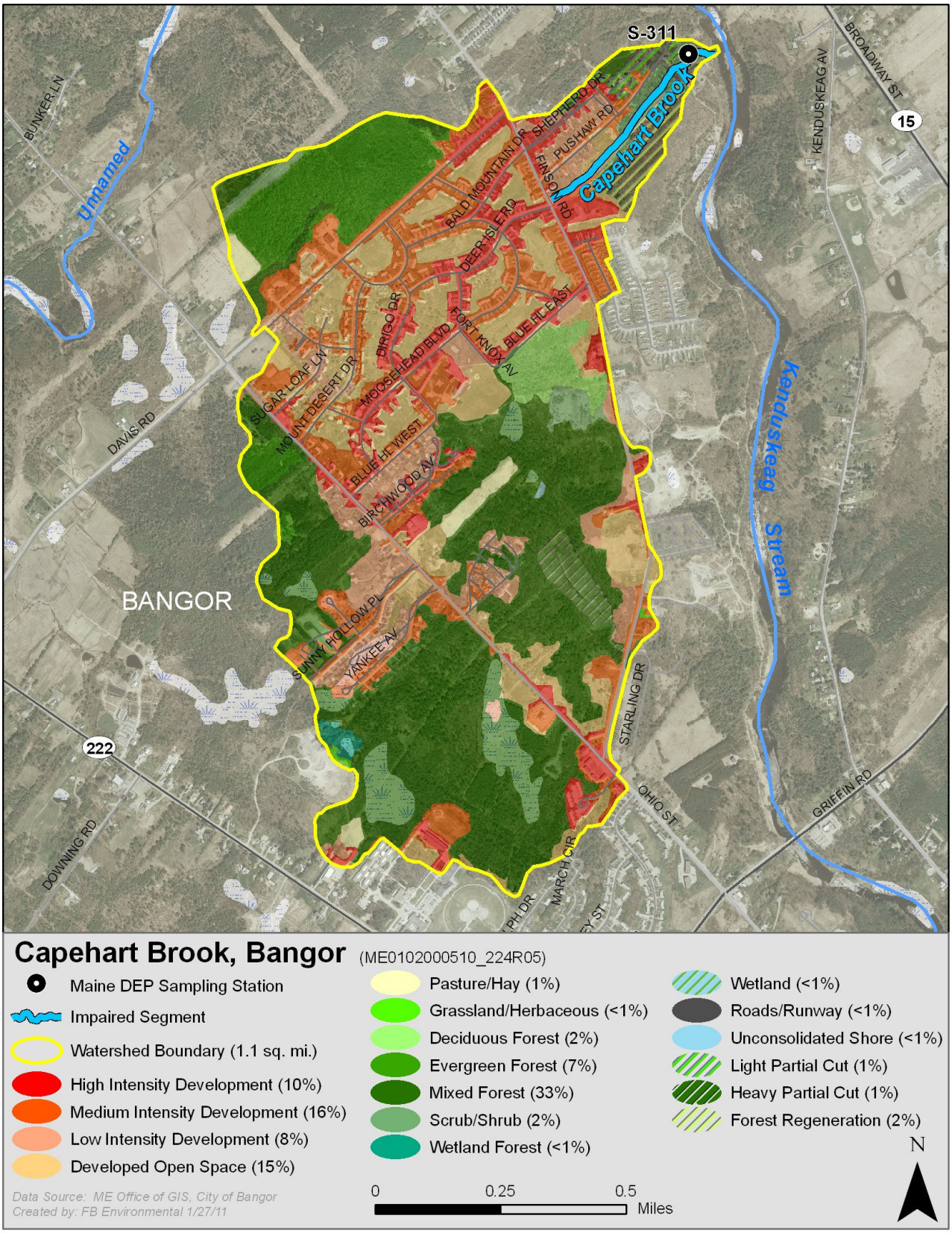


Figure 2: *Map of Capehart Brook watershed land cover.*

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 if Environmental Protection. Revised August, 2002. DEP LW0387-B2002.

Maine Department of Environmental Protection (DEP). 2010. Assessment Database Detail Report for Capehart Brook. Bureau of Land and Water Quality, Augusta, ME.